3.13.1.2 Federal Laws

Federal laws pertaining to noxious and invasive weeds include the Lacey Act as amended (18 USC § 42), the Carson-Foley Act of 1968 (Public Law 90-583), the Federal Noxious Weed Act of 1974, as amended by the Food, Agriculture, Conservation, and Trade Act of 1990 (Section 1453, Management of Undesirable Plants on Federal Lands; 7 USC § 2814 et seq.), the Federal Plant Pest Act (7 USC § 150aa et seq.), and the Plant Protection Act of 2000 (7 USC § 7701 et seq.), as amended by the Noxious Weed Control and Eradication Act of 2004 (Public Law 108-412).

3.13.1.3 Nevada Laws

Chapter 555 of the Nevada Revised Statute pertains to noxious weeds. The Nevada Department of Agriculture is responsible for jurisdiction, management, and enforcement of this state law. The law mandates that plants on Nevada's noxious weed list be controlled on both private and public lands. The law also calls for the establishment of county weed control districts, which are responsible for control and eradication of noxious weeds. The Diamond Valley Weed District coordinates weed control efforts on public and private lands in Eureka County. The Nevada state noxious weed list can be found at URL: http://agri.nv.gov/Plant/Noxious_Weeds/Noxious_Weed_List/.

3.13.1.4 BLM Guidance and Regulations

BLM Manual 9015, *Integrated Weed Management*, provides policy relating to the management and coordination of noxious weeds and other invasive non-native vegetation activities (USDOI BLM 1992b). The policy requires that ground-disturbing projects and projects that alter plant communities be assessed to determine the risk of introducing or spreading noxious weeds and other invasive non-native vegetation. If the risk is moderate or higher, a management program must be established.

Two documents identify broad objectives for management of vegetation on BLM-administered lands—*Partners against Weeds: An Action Plan for the Bureau of Land Management* (USDOI BLM 1996), and *Pulling Together: National Strategy for Invasive Plan Management* (USDOI BLM 1998b). Treatment activities at the local level are guided by the goals, standards, and objectives of land use plans developed for each BLM field office. The BLM's noxious weeds and other invasive non-native vegetation control program has three performance measures: inventory, treatment, and post-treatment effectiveness monitoring. BLM funding is associated with achievement of performance measure targets.

BLM Handbook H-1740, *Integrated Vegetation Management* (USDOI BLM 2008b), and the BLM Battle Mountain District's *Integrated Weed Management Plan Mt. Lewis Field Office and Tonopah Field Office* (USDOI BLM 2009b) direct management of noxious weeds and other invasive non-native plant species within the 3 Bars Project area. The District's weed management plan is most concerned with State of Nevada noxious weeds and invasive annual grasses found on or with the potential to spread into the jurisdictional boundaries of the Battle Mountain District.

3.13.2 Affected Environment

3.13.2.1 Study Methods and Analysis Area

3.13.2.1.1 Study Methods

Information about the presence and distribution of noxious weeds and other invasive non-native vegetation was obtained from past noxious weeds and other invasive non-native vegetation inventory, treatment, and monitoring data, background documents, aerial photographs, visual surveys for cheatgrass conducted during late fall and winter 2009-2010, and rangeland health studies conducted during fall 2010 and summer 2011.

The Mount Lewis Field Office has conducted noxious weed surveys over much of the 3 Bars Project area. These surveys are concentrated in areas that have been disturbed by human factors, sensitive natural areas, high-risk areas (e.g., riparian and wetland areas), high resource value habitat (e.g., for Greater sage-grouse), disturbed areas (e.g., roadsides and rangelands), and heavy public use areas (e.g., recreation sites). Noxious weeds and other invasive non-native vegetation inventory, treatment, monitoring, mapping, and reporting are conducted by Mount Lewis Field Office resource specialists and community partners, including Eureka County, Diamond Valley Weed District, and through Bootstraps, a University of Nevada-Reno Cooperative Extension program developed specifically to conduct noxious weed treatments and inventory throughout the Battle Mountain District (USDOI BLM 2011g).

Rangeland health studies conducted by the BLM and Eastern Nevada Landscape Coalition (Eastern Nevada Landscape Coalition and AECOM 2012), included observations of noxious weeds and other invasive non-native vegetation within representative portions of the project area. Data collected during the studies included information about species composition and dominance within the sampling plots, including presence of canopy gaps, which provides some indication of the potential for invasion of the area by invasive species.

A cheatgrass assessment for the project identified areas of cheatgrass establishment and propagation, as well as areas at risk for new cheatgrass establishment, particularly fire scars. During field surveys conducted in late fall 2009, much of the project area was surveyed for cheatgrass monocultures by ecologists conducting other project-related fieldwork. Ecologists looked for and identified large cheatgrass infestations, and mapped their locations using Global Positioning System technology. Aerial photographs and BLM burn data were reviewed to delineate areas of apparent dense cheatgrass coverage on recent burn areas (post 1984), which are considered areas with a high potential for infestation by cheatgrass monocultures. In February 2010, areas of cheatgrass monoculture potential were surveyed for cheatgrass presence. Recent burn areas were also identified during these surveys. The mapping from these surveys was used to develop cheatgrass coverage polygons for the project area. The results were presented in the *3 Bars Ecosystem and Landscape Restoration Project Cheatgrass Assessment* (AECOM 2011b).

3.13.2.1.2 Study Area

The study area for direct and indirect effects to noxious weeds and other invasive non-native vegetation is the 3 Bars Project area. The CESA for cumulative impacts to noxious weeds and other invasive non-native vegetation includes the Hydrologic Unit Code 10 watersheds wholly, or partially within, the project area (**Figure 3-1**).

3.13.2.2 Noxious Weeds and other Invasive Non-native Vegetation

The Battle Mountain District's noxious weed suppression efforts are concentrated on Russian knapweed, saltcedar (tamarisk), perennial pepperweed (tall white top), hoary cress, various thistle species, and on non-native annual

grasses (USDOI BLM 2009b). Elongated mustard, which is not currently listed by the State of Nevada as a noxious weed, is also of concern, as it is listed as a noxious weed in surrounding states and is found within Eureka County. The 3 Bars Project area is being closely watched for potential establishment and spread of this species.

3.13.2.2.1 Noxious Weeds

Coverage of noxious weed infestations in the 3 Bars Project area is approximately 12,242 acres, or 1.6 percent of the project area. Noxious weeds and non-native annual grasses occur sporadically, particularly infesting wildfire burn scars and other disturbance areas. Noxious weeds are concentrated around areas of high soil disturbance, including roadsides, and areas of soil/water disturbance associated with riparian resources. Areas with the greatest concentration of noxious weeds include the Henderson Creek area, Roberts Creek area, Ferguson Creek, and Gable and Willow Canyons. The most prevalent noxious weeds in the 3 Bars Project area are musk thistle and hoary cress.

As stated in the BLM Battle Mountain District's *Integrated Weed Management Plan Mt. Lewis Field Office and Tonopah Field Office* (USDOI BLM 2009b), the following areas are associated with noxious weeds and non-native invasive species on public lands in the Battle Mountain District.

- Along rights-of-way and improved dirt roads - hoary cress, Russian knapweed, and halogeton.
- Heavily trampled/disturbed rangeland - hoary cress, Russian/spotted knapweed, various thistles, salt cedar, and halogeton.
- Along waterways/flood zones – perennial pepperweed, salt cedar, hoary cress, and various thistles.
- Wildfire burn scars - cheatgrass, red brome, hoary cress, and various thistles.
- Open range - cheatgrass, medusahead rye, and red brome.
- Recreation/industrial - puncture vine and hoary cress.

Table 3-39 provides a summary of the noxious weeds that are known to occur within the 3 Bars Project area, and the recommended control methods for these species.

3.13.2.2.2 Cheatgrass Monocultures

Because cheatgrass is so widespread and established on rangeland within the Battle Mountain District, surveys for this species are not normally conducted. However, areas of observed cheatgrass and areas with the potential for cheatgrass monocultures within the project area have been mapped, as shown on **Figure 3-32**. Mapped areas include relatively large cheatgrass monocultures in former burn areas in the northern half of the project area. Large burn areas in the northern portion of the project area are considered areas of cheatgrass monoculture potential. However, the BLM has seeded many of these burn areas with non-native perennial grasses and forage kochia under the BLM Emergency Stabilization and Rehabilitation Program to combat cheatgrass expansion. During the rangeland health studies, cheatgrass was observed in sampling areas throughout the project area, with the greatest frequency of observance in areas that have been affected by wildfire (Eastern Nevada Landscape Coalition and AECOM 2012). Cheatgrass is likely present in other portions of the 3 Bars Project area, although not necessarily in quantities that warrant treatment.

TABLE 3-39

Noxious Weeds on the 3 Bars Project Area

Species	Typical Habitat	Control method
Black henbane	Open sites with well-drained soils. Roadsides, waste areas, field borders, and pastures.	Mechanical or manual methods prior to seed production; burning dry mature plants; and chemical control by using metsulfuron methyl or picloram.
Canada thistle	Wide range of environmental and soil conditions. Rangeland, pastures, waste areas, roadsides, and along waterways.	Repeated mechanical/manual methods prior to seed production; biological control; chemical control by using 2,4-D, clopyralid, dicamba, glyphosate, or picloram.
Hoary cress	Disturbed alkaline soils. Pastures, fields, roadsides, rangelands, waste areas, and along waterways.	Manual removal; chemical control by using 2,4-D, chlorsulfuron, or metsulfuron methyl. Not effective: Mechanical control.
Musk thistle	Roadsides, pastures and waste areas.	Manual or mechanical methods after bolting but prior to flowering; biological control; chemical control by using 2,4-D, clopyralid, dicamba, chlorsulfuron, metsulfuron methyl, or picloram.
Perennial pepperweed	Moist sites. Floodplains, pastures, meadows, hay fields, and along waterways.	Chemical control by using 2,4-D, chlorsulfuron, glyphosate, imazapic, or metsulfuron methyl. Not effective: Mechanical or prescribed fire treatments.
Russian knapweed	Broad range of sites. Rangeland, waste areas, roadsides, and along waterways.	Chemical control by using chlorsulfuron, clopyralid, or glyphosate. Not effective: Mechanical methods.
Saltcedar	Edges of waterways, lakes, and ponds.	Mechanical/manual control or prescribed fire combined with chemical application; biological control; chemical control by imazapyr, glyphosate, or triclopyr.
Scotch thistle	Pastures, rangelands, roadsides, and waste areas.	Mechanical or manual methods prior to flowering; chemical control by using 2,4-D, chlorsulfuron, clopyralid, dicamba, metsulfuron methyl, or picloram.

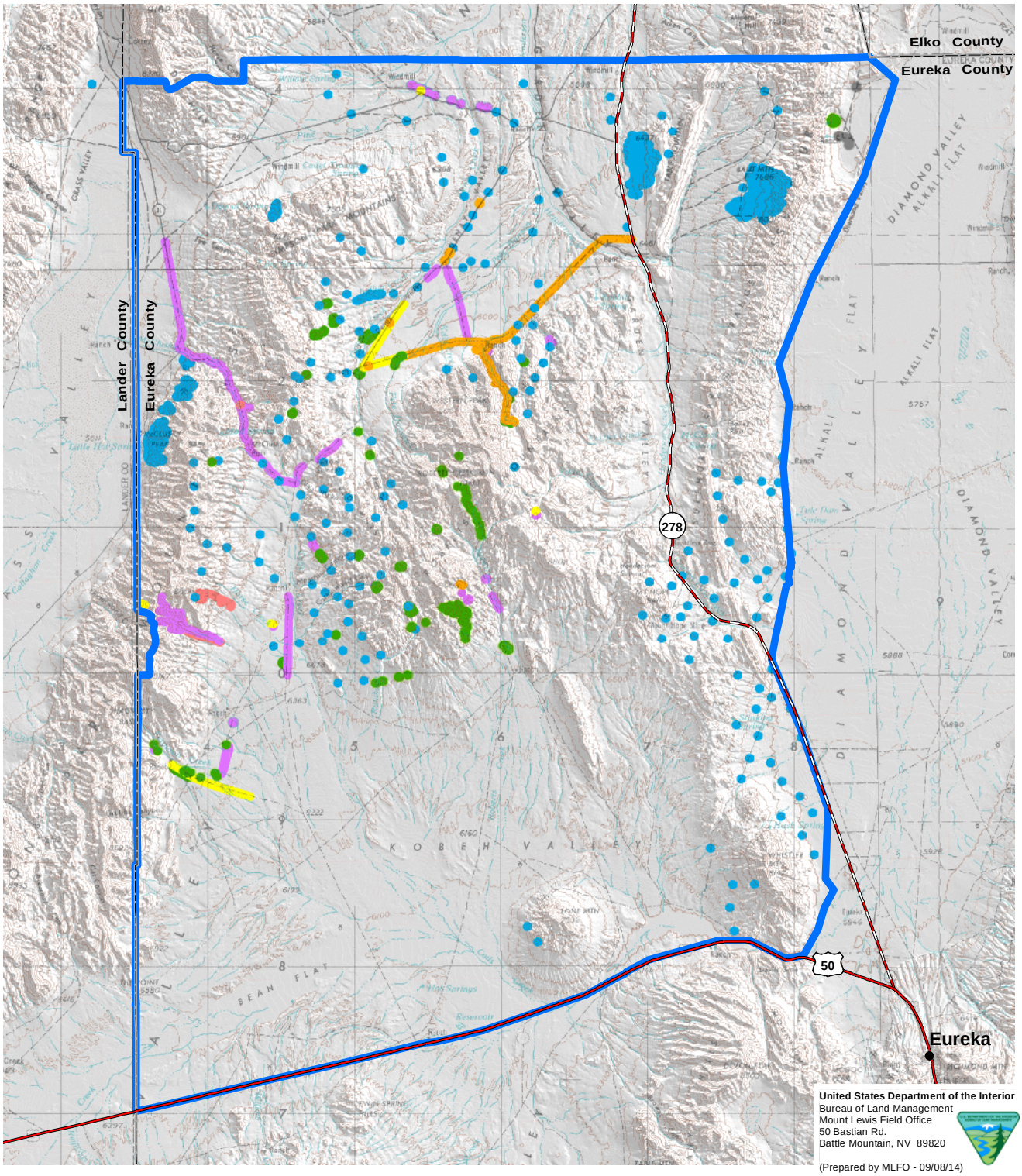
Source: University of Nevada Cooperative Extension (2010).

3.13.3 Environmental Consequences

3.13.3.1 Key Issues of Concern Considered during Evaluation of the Environmental Consequences

Key issues of concern pertaining to noxious weeds and other invasive non-native vegetation were identified in the AECC and during scoping. These include the following:

- The potential for the return of invasive species (primarily cheatgrass) following treatments.
- The potential for disturbance associated with vegetation treatments to increase the abundance of invasive species, or result in the establishment of new invasive species populations.
- The role of livestock grazing and climate change on noxious weeds and other invasive non-native vegetation invasion.
- The potential for treatments to cause invasion of noxious weeds and other invasive non-native vegetation into woodlands, or juniper expansion.



Legend

- Black Henbane
- Cheatgrass
- Hoary cress
- Musk thistle
- Perennial pepperweed
- Russian knapweed
- Scotch thistle
- 3 Bars Project Area

Source: BLM 2010k, 2012g; AECOM 2011b.

3 Bars Ecosystem and Landscape Restoration Project

Figure 3-32

Cheatgrass and Other Weeds

0 1 2 3 4 5 10 Miles

0 1 2 3 4 5 10 Kilometers

N

- Avoid the use of prescribed fire and burn only in areas not at risk of exotic species invasion.
- Concern regarding the use of exotics, such as crested wheatgrass, to restore burned areas.
- Concern that the typical response to fire is to place a fence, which is often permanent, around the perimeter of a burned area.
- Who or what is threatened by the woody vegetation that is termed hazardous fuels, and is cheatgrass a hazardous fuel?
- Concerns about the use of herbicides in native plant communities.

3.13.3.2 Significance Criteria

The following would have a significant adverse effect on vegetation:

- At the end of 10 years, an introduction of noxious weeds and other invasive non-native vegetation into a relatively weed free treatment area at a moderate or high ecological risk, relative to baseline levels.
- At the end of 10 years, an expansion of noxious weeds and other invasive non-native vegetation within and outside of the treatment areas into a relatively weed free area at moderate or high ecological risk, relative to baseline levels.

3.13.3.3 Direct and Indirect Effects

3.13.3.3.1 Direct and Indirect Effects Common to All Action Alternatives

Adverse Effects

Vegetation removal treatments can create conditions that favor early successional species and also result in a temporary loss of more mature vegetation. Most noxious weeds are early successional species that benefit from light and disturbance (Baker 1986). All treatments that cause disturbance or remove plants from an area could lead to a competitive advantage for many noxious weeds and other invasive non-native vegetation, particularly if a seed source is present on the site. There is also some potential for noxious weeds and other invasive non-native vegetation seeds to be transported onto treatment sites on workers' shoes and clothing, with the plant materials used in rehabilitation projects, and on vehicles. It is expected that manual treatments would have a low potential for increasing noxious weeds and other invasive non-native vegetation coverage, given the minimal amounts of disturbance. To minimize these effects, the BLM would follow SOPs to prevent the inadvertent introduction and spread of noxious weeds and other invasive non-native vegetation, and monitor areas where soil is disturbed and where noxious weeds and other invasive non-native vegetation are inventoried or treated. The BLM would also inspect plant materials prior to planting to ensure that they are weed-free, and would identify and plant appropriate seed mixtures and plants suitable for specific habitats. It is assumed that the risks associated with manual treatments would be similar for all project groups.

Beneficial Effects

All treatments, or combinations of treatments, designed to control noxious weeds and other invasive non-native species would be expected to have a beneficial impact by reducing populations of these species. The reduction of fuel loads would decrease the risk of severe or repeat wildfires, thereby reducing the risk of spread of cheatgrass and other

noxious weeds and other fire-dependent invasive non-native species. By removing these species, overall ecosystem health and functionality would improve, and by restoring rangeland health native species would be better able to compete with noxious weeds and other invasive non-native species.

3.13.3.3.2 Direct and Indirect Effects under Alternative A (Preferred Alternative)

Riparian Treatments

Adverse Effects

Some of the proposed projects could promote the establishment and spread of noxious weeds and other invasive non-native vegetation. Machinery used in mechanical treatments can result in inadvertent removal of native vegetation, and has the potential to spread seeds of noxious weeds and other invasive non-native vegetation. Furthermore, soil disturbance stimulates germination of noxious weeds and other invasive non-native vegetation seeds by providing physical cues that competing vegetation is absent (Cornell University Weed Ecology and Management Laboratory, no date). Additionally, vehicles and other mechanical equipment can damage or crush existing desirable riparian and wetland vegetation or bring propagules of non-native species into treatment areas and create sites for noxious weeds and other invasive non-native vegetation establishment (BLM 2007c:4-45). The risks for loss and damage to existing riparian and wetland vegetation and spread of noxious weeds and other invasive non-native vegetation would be greatest in project groups with the largest acreage and that employ the most extensive mechanical treatments (project groups that include streambank earthwork as well as pinyon-juniper removal (Garden Spring Group and Frazier Creek Group). For the Denay Pond group, the disturbance associated with mechanical treatments would be minimal, since only fence installation would occur.

Beneficial Effects

Successful control of invasive plants in riparian zones using manual and mechanical methods would lead to improved conditions in these habitats over the long-term. The eventual growth of desirable vegetation in treated areas would moderate water temperature, buffer the input of sediment from runoff, and promote bank stability in riparian zones. Efforts by the BLM to enhance wetland and riparian vegetation would also help to increase the number of miles of stream and acres of wetlands that are in Proper Functioning Condition.

Aspen Treatments

Adverse Effects

The risks of introduction and spread of noxious weeds and other invasive non-native vegetation through manual and mechanical methods would be similar to those described for riparian zones. At all aspen treatment areas, the risks associated with manual treatments would be low, since a minimal amount of soil disturbance would occur, SOPs would be implemented to prevent the establishment and spread of noxious weeds and other invasive non-native vegetation, and woody debris would be left onsite to promote seedling and sapling establishment.

Treatment activities that cause soil disturbance and create open conditions, including mechanical methods and fire, could facilitate noxious weeds and other invasive non-native vegetation establishment and spread. These include project areas where pinyon-junipers would be removed (JD-A4 group and RM-A2 group). In areas where the mechanical treatments are limited to cutting aspen or ripping root masses, less disturbance would be expected given the targeted nature of these treatments.

Beneficial Effects

While noxious weeds and other invasive non-native vegetation control is not identified as part of the treatment design for these sites, the BLM could use manual and mechanical methods to treat noxious weeds and other invasive non-native vegetation that are present on aspen treatment areas. By directly targeting noxious weeds and other invasive non-native vegetation in the course of completing other proposed treatments, the proposed project would have a beneficial effect on native plant communities.

Pinyon-juniper Treatments

Adverse Effects

Manual and mechanical treatments could cause soil disturbance that leads to the establishment and spread of noxious weeds and other invasive non-native vegetation, as increased light availability in the site and shading of desirable understory plants by heavy slash could provide conditions that favor invasive species (Tausch et al. 2009). Chainsaw cutting in juniper woodlands has been correlated with increased shrub and grass cover, which may include at least an initial increased cover of cheatgrass on sites where a seed source for this species is present (Miller et al. 2005). Fire risks associated with slash would be mitigated to some degree by associated programs to use felled trees for posts, mulch, or other forest products uses, and following manual treatments with pile and slash burning. In some areas, the creation of fire and fuel breaks could also lead to noxious weeds and other invasive non-native vegetation establishment and spread.

Grasses and forbs would benefit from prescribed fire and would be the first to revegetate the site. If non-native annual grasses and forbs occur on a site prior to fire, and if fire intensity is high, then non-native annual grasses and forbs would be the first to establish after a fire. Without other treatments, such as the use of herbicides, non-native annual grasses and forbs may dominate the site (USDOI BLM 2012g). The BLM generally has had good success in controlling non-native vegetation and allowing native vegetation to establish on sites treated using prescribed fire on the 3 Bars Project area (see Section 3.12.3.3). However, some sites could require seeding or other rehabilitation efforts following the fires, or it could take decades following a fire to fully establish all desired vegetation including understory vegetation and mixed-aged stands of pinyon-juniper.

Cheatgrass could potentially increase in dominance following a fire. Over time, the presence of cheatgrass in an area can increase the frequency of fire, potentially altering the successional trajectory, such that the understory never progresses from annual grass to perennial grass and shrub/grass mix, and the community never returns to a perennial grass or woodland stage (Miller and Tausch 2001, Ansley and Rasmussen 2005). Therefore, fire treatments would be most successful on sites where perennial grasses are likely to recover and establish after treatment, and least successful on sites where cheatgrass is present. Increased dominance of cheatgrass is particularly a concern for the Sulphur Spring Wildfire Management Unit, where wildfires would be allowed to burn for resource benefit, and where cheatgrass is already present, including a large monoculture (see **Figure 3-32**). However, the BLM would take into account the potential for cheatgrass to respond to fire when managing wildland fires in this area. The BLM would also take into account the live fuel moisture conditions, weather conditions and trends, whether the fire would meet management objectives, and the fire return interval (i.e., if an area has recently burned, it would not be allowed to burn again until it is within the range of the normal fire return interval). Fires would be suppressed during periods of low fuel moisture, or in areas with large populations of cheatgrass. Since cheatgrass is present throughout the Sulphur Spring Wildfire Management Unit, the potential for cheatgrass spread as a result of treatments exists. Rehabilitation

following the treatment would be conducted in areas where native communities are unlikely to regrow after a fire. Additionally, all sites are monitored for at least 3 years to assess whether further action is needed.

Beneficial Effects

The predominant noxious weeds and other invasive non-native vegetation infestations in pinyon-juniper treatment areas are cheatgrass, musk thistle, and black henbane. Treatments directed at these and other weeds during the course of completing proposed pinyon-juniper enhancement projects would be expected to have a beneficial effect on ecosystem health.

The BLM would restore fire as an integral part of the ecosystem, improve species diversity, and reduce hazardous fuels on the Sulphur Spring Wildfire Management Unit by using wildland fire for resource benefit. The BLM would allow fire to burn on about 20 to 40 percent of the area, but generally burns would be limited to small acreages to create a mosaic of habitats and to create fuel breaks. By keeping burned areas small, the risk of a cheatgrass infestation is much less.

Sagebrush Treatments

Adverse Effects

Treatments to reduce herbaceous dominance (Rocky Hills Unit) and treat cheatgrass (West Simpson Park Unit) would potentially have short-term adverse effects on sagebrush habitats. However, provided project objectives are met, the long-term goal of these treatments is to improve the quality of sagebrush habitats. In some cases, the species composition at treatment sites would change, as sagebrush enhancement projects would focus on the components of Greater sage-grouse habitat. For instance, at the Rocky Hills Unit, the long-term result of the project would be to minimize the herbaceous component and increase the sagebrush component.

Manual and mechanical treatments would have the potential to disturb sagebrush habitats, with potential impacts similar to those discussed for other community types. Ground disturbance associated with mechanical treatments could occur on all of the sagebrush project areas. These treatments could potentially result in trampling and inadvertent removal of non-target plants, as well as soil disturbance that could favor the establishment and spread of cheatgrass and other noxious weeds and other invasive non-native vegetation. The greatest risk for adverse effects would occur where the largest ground areas are disturbed, and where noxious weeds and other invasive non-native vegetation seeds are already present.

Biological control has been identified for use to remove cheatgrass, crested wheatgrass, and forage kochia. Grazing can contribute to the spread of noxious weeds and other invasive non-native vegetation through preferential grazing of native vegetation over noxious weeds and other invasive non-native vegetation, and by movement of noxious weeds and other invasive non-native vegetation into uninfested areas via livestock feces (USDOI BLM 2007c). Therefore, there would be some risk of establishment or spread of noxious weeds and other invasive non-native vegetation in treatment areas since these species are already present in the areas. Using SOPs to prevent noxious weeds and other invasive non-native vegetation spread, monitoring, and follow-up treatments would help to minimize these risks.

Beneficial Effects

Prescribed fire and broadcast seeding could be used on the West Simpson Unit to control cheatgrass. Livestock could be used to biologically control cheatgrass. In all areas where the BLM would employ the use of livestock as a biological control, other control methods would also be used to restore ecologically functioning sagebrush habitat. These could include mechanical treatments such as discing and seeding. These efforts to reduce cheatgrass cover would have a beneficial outcome in these areas.

The Rocky Hills Unit was replanted with non-native crested wheatgrass and forage kochia after the 1999 Trail fire. Crested wheatgrass can establish with minimal seedbed preparation, can survive periods of drought, and can compete with weedy species (Davies et al. 2010). This species, however, is a prolific seed producer that can dominate a site and exclude native vegetation, including the native bunchgrasses and big sagebrush that offer better wildlife value (Monson 2002, Braun 2006). Forage kochia was originally introduced into the U.S. to compete with halogeton. It has since been shown to compete well against other aggressive, exotic annual noxious weeds and other invasive non-native vegetation such as cheatgrass, Russian thistle, and medusahead rye. Plantings of forage kochia can decrease densities of annual weeds, thus decreasing fire intervals of degraded rangelands while providing valuable forage to livestock and forage and cover for wildlife (Tilley et al. 2006).

Projects that target non-native vegetation, including cheatgrass, crested wheatgrass, and forage kochia would be beneficial for native vegetation, as they would help to restore native sagebrush communities in these areas that are currently dominated by a non-native species. Competition from these non-native species has limited sagebrush expansion in previously burned areas. The BLM proposes to restore areas seeded with crested wheatgrass and forage kochia to native vegetation. Non-native vegetation would be treated in strips. As treated strips are restored with native vegetation, additional strips would be treated. Pehrson and Sowell (2011) studied methods to eliminate crested wheatgrass and establish sagebrush. They found that no technique eliminated crested wheatgrass in a single application. Grazing and fire had no long-term impacts on crested wheatgrass. Mechanical treatments, such as plowing, discing, and cultivating reduced and eradicated crested wheatgrass, but invasive grasses followed treatments and made it difficult to establish native seeded species.

In some areas dominated by cheatgrass, the BLM may initiate a phased succession approach to restoration that includes treating the area with various methods, including mechanical treatments and prescribed fire, and then planting the area with crested wheatgrass and forage kochia to compete directly with remaining cheatgrass. Once these species have stabilized the site, the BLM would begin to convert the site back to native vegetation.

3.13.3.3.3 Direct and Indirect Effects under Alternative B (No Fire Use Alternative)

Given that fire would not be used under this alternative, treatment programs might not be as effective as under Alternative A. Because only mechanical and manual methods would be used, it would be difficult for the BLM to conduct hazardous fuels reduction, and noxious weeds and other invasive non-native vegetation treatments on steep hillslopes or over large acreages. The BLM would not be able to use fire to remove the mat of dead vegetation in cheatgrass-dominated areas, or to promote the health and resiliency of native vegetation. Thus, the wildfire risk would be greater under this alternative than under Alternative A, as would the potential for establishment and spread of noxious weeds and other invasive non-native vegetation.

3.13.3.3.4 Direct and Indirect Effects under Alternative C (Minimal Land Disturbance Alternative)

Given that fire and mechanical methods would not be used under this alternative, the BLM would have the fewest options for its treatment programs, and these programs would likely not be as effective as under the other action alternatives. The BLM would be unable to combine treatment methods for optimal control of cheatgrass and other noxious weeds and other invasive non-native vegetation. Because this alternative is the most limited in terms of the tools available for large scale restoration, it is the least likely of the action alternatives to help attain larger ecosystem restoration goals for the 3 Bars Project area.

Because only manual methods would be used, it is unlikely that the BLM would slow the spread of noxious weeds and other invasive non-native vegetation, including cheatgrass; restore fire as an integral part of the ecosystem; and reduce extreme, very high, and high wildfire risks to moderate risk or less. Thus, wildfire risk would be greater under this alternative than under Alternatives A and B, as would the potential for establishment and spread of noxious weeds and other invasive non-native vegetation.

3.13.3.3.5 Direct and Indirect Effects under Alternative D (No Action Alternative)

There would be no direct effects to noxious weeds and other invasive non-native vegetation from 3 Bars Project treatments as no treatments would be authorized under this alternative. Under this alternative, the BLM would not create fire and fuel breaks; thin and remove pinyon-juniper to promote healthy, diverse stands; treat large-scale infestations of noxious weeds and other invasive non-native vegetation, especially cheatgrass; restore fire as an integral part of the ecosystem; or reduce the risk of a large-scale wildfire. Threats to ecosystem health under this alternative would be associated with the ongoing expansion of noxious weeds and other invasive non-native vegetation; continued decline of ecosystem health due to further decline in native understory species in the upland plant communities; further expansion of pinyon-juniper woodland into other communities, including sagebrush, riparian, and aspen habitats; and the continued increase of the risk for catastrophic wildfire as a result of high fuel loads. Given the low acreage treated annually, there would be little or no improvement in reducing the amount of acreage infested with noxious weeds and other invasive non-native vegetation.

3.13.3.4 Cumulative Effects

The CESA for noxious weeds and other invasive non-native vegetation is approximately 1,841,698 million acres and includes those watersheds at the Hydrologic Unit Code 10 level that are all or partially within the 3 Bars Project area (**Figure 3-1**). Past and present actions that have influenced noxious weeds and other invasive non-native vegetation activity in the 3 Bars ecosystem are discussed in Section 3.3.2.3.3.

3.13.3.4.1 Cumulative Effects under Alternative A (Preferred Alternative)

Historic overgrazing, introduction of cheatgrass, large wildfires, and other natural and human-caused factors have contributed to the departure of the plant communities from the Potential Natural Community across the 3-Bars ecosystem. This has led to a decrease in the functionality of ecological processes, thus reducing the resilience and resistance of these ecosystems to disturbance. The treatments proposed in the 3-Bars ecosystem are designed to provide the means needed for these ecosystems to recover.

In the short-term, small, temporary exclusion fences may change the distribution of grazing by livestock, wild horses, and some wildlife. As distribution patterns change, utilization would also change. Utilization would decrease in treatment areas while temporary exclusion fences are in place, but would increase in other areas. Once the temporary

exclusion fences are removed, animals may be attracted to the treatment areas resulting in potentially higher use of the area than before. Temporary exclusion fences would exclude livestock, although AUMs may be temporarily suspended to prevent overuse in other areas.

The BLM would continue using ground-based herbicide applications to remove noxious weeds and other invasive non-native vegetation, and aerial-based application methods to remove cheatgrass, and would restore burned areas under the Burned Area Emergency Stabilization and Rehabilitation program, under existing authorizations. These treatments would help to reduce hazardous fuels, slow the spread of noxious weeds and other invasive non-native vegetation, and reduce surface runoff and erosion associated with burn sites on about 1,000 acres annually. The active ingredients in herbicide formulations could adversely affect non-target vegetation under one or more exposure scenarios, particularly for aerial applications, and accidental exposure scenarios such as a spill (USDOI BLM 2007b:4-47).

Agriculture, land development, mineral development, and oil, gas, and hydrothermal exploration and development could affect about 10,000 acres in the reasonably foreseeable future, including about 8,335 acres of disturbance associated with the Mount Hope Project. Although some of the disturbance from these projects would be reclaimed, these activities would lead to long-term losses in native plant communities in the affected areas, and entail disturbance that could facilitate the establishment and spread of noxious weeds and other invasive non-native vegetation.

Since 1985, approximately 7,000 acres have burned annually in the CESA, although the acreage burned annually is quite variable. It is projected that an additional 140,000 acres could be burned in the CESA during the next 20 years. A wildfire would cause the wide-scale removal of vegetation in the CESA, and would also lead to the spread of noxious weeds and other invasive non-native vegetation.

Hazardous fuels reduction, habitat improvement, and noxious weed and other invasive non-native vegetation control projects would occur on up to 142,000 acres (127,000 for the 3 Bars Project and 15,000 acres for other hazardous fuels projects in the CESA), or 8 percent of the CESA. As discussed under direct and indirect effects, these treatments would lead to short-term increases in noxious weeds and other invasive non-native vegetation.

Long-term, these treatments should result in a reduction of noxious weeds and other invasive non-native vegetation and return of native and non-invasive vegetation that is more fire resilient, more abundant, and similar to the Potential Natural Community. These treatments would also help to reduce the risk of wildfire within the CESA, which often leads to the establishment and spread of noxious weeds and other invasive non-native vegetation.

3 Bars Project treatments would affect less than 1 percent of the CESA annually, and these effects should be beneficial long-term. Thus, there would be a negligible short-term accumulation of adverse effects and minor long-term accumulation of benefits from 3 Bars Project actions combined with effects from other treatments.

3.13.3.4.2 Cumulative Effects under Alternative B (No Fire Use Alternative)

Under Alternative B, effects from non-3 Bars Project reasonably foreseeable future actions on noxious weeds and other invasive non-native vegetation would be similar to those described under Alternative A. The BLM would treat about half as many acres under Alternative B as under Alternative A, and less effort would be spent by the BLM on treatments to reduce wildfire risk and its impacts on vegetation, including the use of fire to restore natural fire regimes.

The use of mechanical treatments would give the BLM greater latitude to control various types of vegetation compared to fire treatments, but efforts to control cheatgrass and other noxious weeds and other invasive non-native vegetation would be difficult on steep slopes and over large acreages. Hazardous fuels reduction and habitat improvement projects could occur on about 63,000 acres within the 3 Bars Project area, and on about 15,000 acres within other portions of the CESA, or about 4 percent of the acreage within the CESA. Thus, the BLM would be less successful in controlling noxious weeds and other invasive non-native vegetation on the project area and in the CESA under Alternative B than under Alternative A.

3.13.3.4.3 Cumulative Effects under Alternative C (Minimal Land Disturbance Alternative)

Under Alternative C, effects from non-3 Bars Project reasonably foreseeable future actions on noxious weeds and other invasive non-native vegetation would be similar to those described under Alternative A. Under Alternative C, the BLM anticipates treating about one-fourth as many acres as under Alternative A. Adverse, short-term effects to vegetation associated with the use of fire and mechanized equipment would not occur under Alternative C.

By not being able to use mechanical methods, such as mowing, chopping, tilling, discing, harrowing, and drill seeding, the BLM would do little to reduce hazardous fuels, create fire and fuel breaks, treat areas with noxious weeds and other invasive non-native vegetation, or remove downed wood and slash. Thus, the risk of wildfire and spread of noxious weeds and other invasive non-native vegetation would remain high on the 3 Bars Project area and within the CESA. Only about 32,000 acres, or about 2 percent of the CESA, would be treated within the CESA. These treatments would benefit the 3 Bars ecosystem, but not to the extent as under Alternatives A and B.

3.13.3.4.4 Cumulative Effects under Alternative D (No Action Alternative)

Under Alternative D, effects from non-3 Bars Project reasonably foreseeable future actions on noxious weeds and other invasive non-native vegetation would be similar to those described under Alternative A. There would be no cumulative impacts to noxious weeds and other invasive non-native vegetation from 3 Bars Project treatments from this alternative as no treatments would be authorized under this alternative. The BLM could create fire and fuel breaks; thin and remove pinyon-juniper to promote healthy, diverse stands; slow the spread of noxious weeds and other invasive non-native vegetation, especially cheatgrass; restore fire as an integral part of the ecosystem; and reduce the risk of a large-scale wildfire under current and reasonably foreseeable future authorized actions, but on a very limited acreage. Thus, factors that contribute to the spread of noxious weeds and other invasive non-native vegetation would remain, and would likely be greatest under this alternative.

3.13.3.5 Unavoidable Adverse Effects

The proposed vegetation treatments would cause unavoidable short-term disturbances to plant communities by removing both target and non-target vegetation. In some cases, treatments would return all or a portion of the treated area to an early successional stage by freeing up resources such as light and nutrients. These adverse effects would be temporary and would consist of short-term losses of native vegetation and associated habitat values.

3.13.3.6 Relationship between the Local Short-term Uses and Maintenance and Enhancement of Long-term Productivity

The proposed vegetation treatments would have short-term adverse impacts on non-target vegetation, including native trees, shrubs, forbs, and grasses, as these could inadvertently be removed during treatments. Treatments that remove

or control noxious weeds and other invasive non-native vegetation could provide immediate benefits to native species, such as increased access to water and nutrients and enhanced vigor from reduced competition with invasive species. Over the long-term, treatments should also reduce the incidence and severity of wildfire across the project area.

Treatments that control populations of noxious weeds and invasive and non-native species on public lands would be expected to benefit native plant communities over the long-term by aiding in the reestablishment of native species. The degree of benefit would depend on the success of these treatments over both the short- and long-term. Some treatments are very successful at removing noxious weeds and other invasive non-native vegetation over the short-term, but are not successful at promoting the establishment of native species in their place. In such cases, seeding and planting of native plant species would be beneficial.

3.13.3.7 Irreversible and Irretrievable Commitment of Resources

Loss of native vegetation and plant productivity as a result of treatments would persist only until vegetation was reestablished, usually within several growing seasons.

3.13.3.8 Significance of the Effects under the Alternatives

While treatments would result in short-term increases in populations of noxious weeds and other invasive non-native species such as cheatgrass, post-treatment control and rehabilitation are expected to slow the spread of noxious weeds and other invasive non-native vegetation. Under Alternative C, mechanical methods would not be used to target noxious weeds and other invasive non-native vegetation and vegetation control might be more difficult, although manual methods of weed control could still be used successfully, particularly if the treatment area is relatively small. Under Alternative A, the spread of cheatgrass following prescribed or wildland fire for resource benefit is of particular concern. Additionally, SOPs would require the BLM to address the potential proliferation of cheatgrass when planning burns or assessing rehabilitation needs post-burn. Since the significance criteria allow 10 years to control noxious weeds and other invasive non-native vegetation that are introduced as a result of treatments, additional monitoring beyond 3 years would be required to ensure that no further control is required beyond the standard 3-year monitoring period.

3.13.4 Mitigation

Noxious weed and other invasive and non-native vegetation control would benefit from mitigation measures identified in Section 3.18.4 (Livestock Grazing Mitigation). No mitigation or monitoring measures are recommended specifically for noxious weed and other invasive non-native vegetation control.

3.14 Wildland Fire and Fire Management

Species diversity within a plant community depends on species composition, the adaptive traits of plants, the timing of fire, and the nature of fire as it moves through the community. The spatial arrangement of fuels and individual plants can be important to survival, particularly where fuels are unevenly distributed. Concentrations of live or dead fuels can generate high fire intensities and severities on relatively small sites, which can enhance or reduce diversity depending on the community. The areas within and surrounding the 3 Bars ecosystem are of high value to the Mount Lewis Field Office. The area has a high occurrence of wildfires with large fire potential in many places as demonstrated by past fire history and deviation from historic fire regimes. The Battle Mountain District provides aggressive initial attack for all fires within this area.

3.14.1 Regulatory Framework

The Battle Mountain District Fire Management Program is guided by the policies expressed in national policy documents and referenced in Chapter 1. District policy documents include the *Approved Resource Management Plan Amendment for Fire Management with Environmental Assessment and Decision Record Shoshone-Eureka Planning Area* (Shoshone-Eureka Fire Land Use Plan Amendment; USDOI BLM 2002); and the 2004 *Battle Mountain District Fire Management Plan* (Fire Management Plan; USDOI BLM 2004a).

In addition, fire management guidance is provided by the following BLM documents:

BLM Manual 1740, *Renewable Resource Improvements and Treatments* (USDOI BLM 2008j), and BLM Manual Handbook H-1740-1, *Renewable Resource Improvement and Treatment Guidelines and Procedures* (USDOI BLM 2007g), provide guidance and procedures for management and treatment of renewable resources, including utilization of management prescribed fire and emergency fire rehabilitation.

BLM Handbook 1742, *Burned Area Emergency Stabilization and Rehabilitation* (USDOI BLM 2007h), provides guidance for emergency fire rehabilitation including measures to prevent accelerated soil erosion and establishment of noxious and invasive plant species, and post fire management of restoration areas.

BLM Manual 9212, *Fire Prevention*, is consistent with Departmental policy (910 Department Memorandum 1.4), and it is the BLM's policy that:

- Prevention of catastrophic wildfires is a high priority. Commitment to an effective wildland fire prevention program is expected at all levels within the Bureau.
- The wildfire prevention program shall be designed to minimize losses from fire consistent with resource objectives identified in RMPs.
- Wildfire prevention shall stress the analysis of risks, hazards and values and the development of specific educational, engineering, enforcement and administrative prevention actions.
- Wildfire prevention activities shall be coordinated with all federal, state, county, and municipal agencies.
- Each state and district office shall provide coordination, guidance, and assistance to achieve an aggressive wildfire prevention program and shall maintain and update as required a Wildfire Prevention Plan integrated with the Fire Management planning process.
- Wildfire Prevention Program funding shall be consistent with the identified needs as determined through a prevention analysis that is approved as an operational plan of the Fire Management Plan (BLM 9212-1).
- The BLM shall emphasize the use of hazardous fuel reduction techniques as part of the wildfire prevention program.

BLM Manual 9214, *Prescribed Fire Management*, and BLM Handbook H-9214-1, *Prescribed Fire Handbook*, describe the authority and policy for prescribed fire use on public lands administered by the BLM. It is BLM policy that:

- The role of fire and its potential use will be considered in establishing the management strategy for all ecosystems.

- Prescribed fires may be initiated by planned or unplanned (unscheduled) ignition.
- All prescribed fire (including hazard reduction) projects will support one or more approved land management objective(s) derived from the Bureau's land management planning process.
- The planning and execution of the prescribed fire will be funded by the benefiting program(s).
- Each prescribed fire project will have an approved Prescribed Fire Plan completed before ignition.
- Each prescribed fire will be managed and executed in conformance with the approved plan by qualified personnel. The term qualified will include experience, training, and physical fitness for key positions.
- Prescribed fire projects will comply with federal, state and local regulations and standards, including air quality and smoke management programs.
- Pre-burn, burn, and post-burn fuel and weather measurement(s) will be taken on all prescribed fire projects for planning purposes, prescription, compliance, and project evaluation. It may not be necessary to take post-burn weather measurements on fuel reduction projects.
- Pre-burn and post-burn monitoring will be conducted to determine whether resource and fire objectives are achieved, unless where previous documented experience is adequate to predict post-burn results.

The Eureka County Master Plan discusses fire management and makes these recommendations regarding burning within the County (Eureka County 2010):

- Prevent significant deterioration of the superior air quality found in Eureka County.
- Manage smoke from prescribed burns through techniques of smoke avoidance, dilution, and emission reduction, and limit unnecessary emissions from existing and new point and nonpoint sources through development and implementation of best management practices.
- Engage federal land management agencies in burn planning.
- Conduct prescribed burning at the maximum rate allowed by Clean Air Act and State regulations.
- Maintain records of both acreage and tonnage burned and compare to allowable values.
- Review burn plans for compliance with best management practices for point source emissions.
- Review burn calculations and plans to assure that air quality maximums are not exceeded.
- Evaluate whether prescribed burning plan conforms to the requirements and guidelines for air quality and smoke management being developed by the State of Idaho.
- Review best management practices as necessary to assure applicability and compliance.
- Conduct an annual review of the backlog of prescribed burns, pending applications, and requests for additional prescribed burns to incorporate them into the following year annual plan.

For wildfires, Eureka County supports the right for local citizens to protect their property from fires originating on state and federal lands. The County advocates active fire management on federal lands, including, where appropriate and in consultation with grazing permit holders, adjacent landowners, local volunteer fire fighters and Eureka County, a let-burn policy. The County is opposed to arbitrary and inequitable restriction of post-fire land use for recreation and

livestock grazing. The County insists that all post-fire land use restrictions be adequately justified and based on peer-reviewed science (Eureka County 2010).

3.14.2 Affected Environment

3.14.2.1 Study Methods and Study Area

The following documents were important sources of information for this assessment:17-States PER (USDOI BLM 2007c); *Wildland Fire in Ecosystems Effects of Fire on Flora* (USDA Forest Service 2000); *Proceedings of the Invasive Species Workshop: The Role of Fire in the Control and Spread of Invasive Species* (Tall Timbers Research Station 2001); Shoshone-Eureka Fire Land Use Plan Amendment (USDOI BLM 2002); Fire Management Plan (USDOI BLM 2004a); *Wildland Fire in Ecosystems: Fire and Non-native Invasive* Plants (Zouhar et al. 2008); and AECC (USDOI BLM 2009a). Information about the occurrence of wildland fires was obtained from historic records maintained by the Battle Mountain District Office, field surveys, and discussions with District fire management staff.

The study area for direct and indirect effects to resources affected by fire management activities lies within the 3 Bars Project area. The cumulative effects study area includes the Hydrologic Unit Code 10 watersheds within, or partially within, the project area (**Figure 3-1)**.

3.14.2.2 Fire Incidence in the 3 Bars Project Area

Since 1985, about nine fires have occurred annually within the project area, burning about 4,225 acres annually and about 520 acres per fire. The number of fires and acres burned was higher in the mid- to late-1990s than during the past decade (**Figure 3-33**, **Table 3-40**).

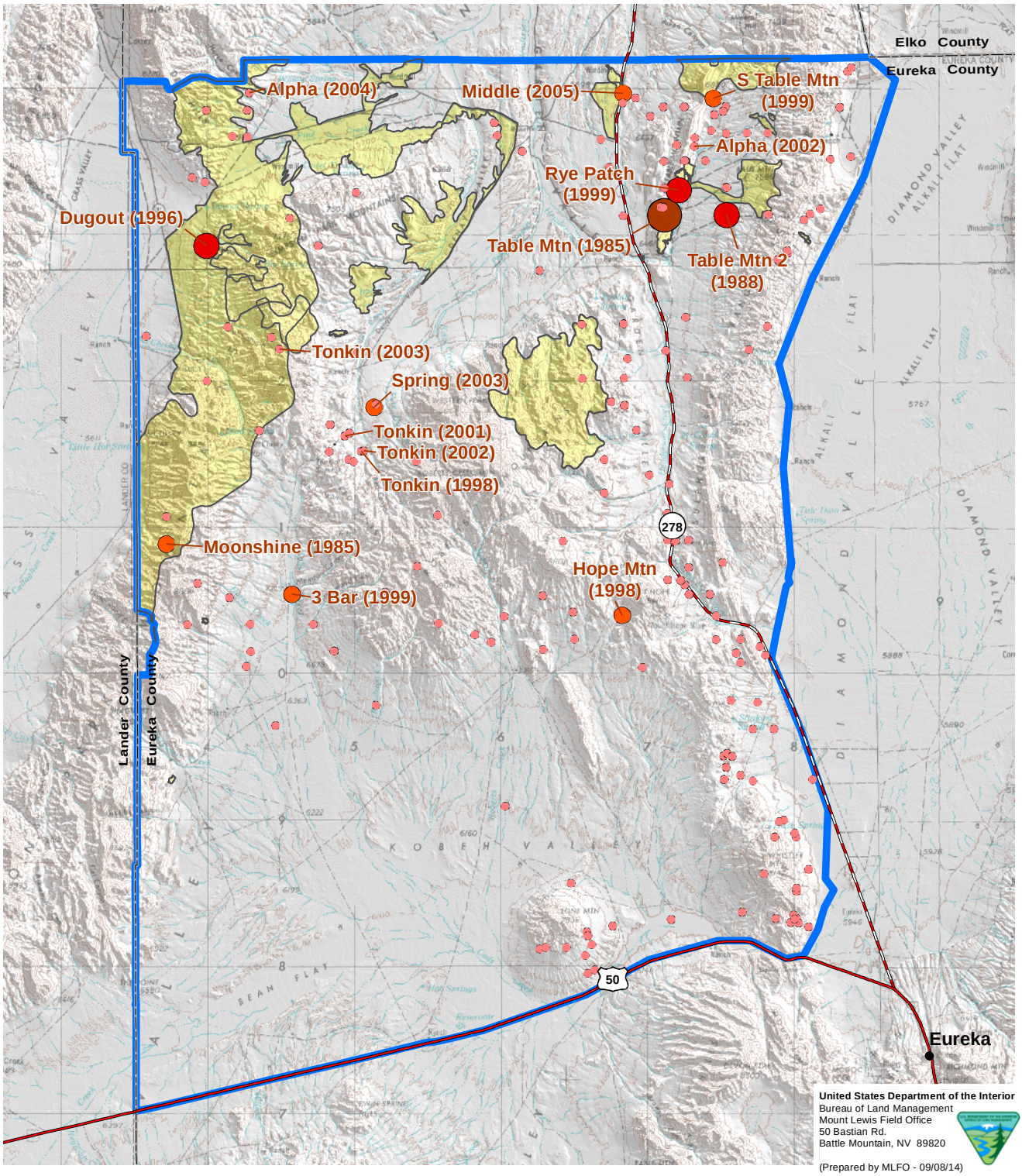
3.14.2.3 Fire Regimes and Fire Condition Classes in the 3 Bars Project Area

A natural fire regime is a general classification of the role fire would play across a landscape in the absence of modern human mechanical intervention, but including the influence of aboriginal burning (Agee 1993, Brown 1995). Coarse scale definitions for natural (historical) fire regimes have been developed by Hardy et al. (2001) and Schmidt et al. (2002) and interpreted for fire and fuels management by Hann and Bunnell (2001). Fire regimes are based on a number of factors including frequency, intensity, size, pattern, season, and severity. Individual fires can vary greatly in severity, and the specific effects and risks caused by a fire will depend on the specifics of its fire regime. As shown in **Table 3-41**, the BLM has identified five fire regimes, three of which occur in the 3 Bars Project Area.

An FRCC is a classification of the amount of departure from the natural regime. The BLM has identified three FRCCs, as described in **Table 3-42**. Based on FRCCs, the BLM determines where to use fire and other treatment methods to restore public lands to their natural fire regime. For the 3 Bars Project, treatments are focused on FRCC II and III areas.

Fire risk is different than FRCC. Fire risk involves several factors, including ignition sources, fuels topography, and weather, while FRCC is a classification of the amount of departure from the natural regime (Hann and Bunnell 2001).

As discussed earlier, current fire regimes have deviated substantially from historical regimes, as shown in **Figures 3-34** and **3-35**, and **Tables 3-41** and **3-42**. Nearly 80 percent of lands on the project area were historically in Fire Regime IV, while nearly 90 percent of acreage is now within FRCC II. This has led to moderate to extreme risks for a catastrophic fire on the project area (**Figure 3-36**; USDOI BLM 2009a).



Legend

Fire Starts (1985 - 2008)

- 0 - 10 ac.
- 10 - 100 ac.
- 100 - 1,000 ac.
- > 1,000 ac.

- Large Fire Perimeter (1985 - 2012)
- 3 Bars Project Area

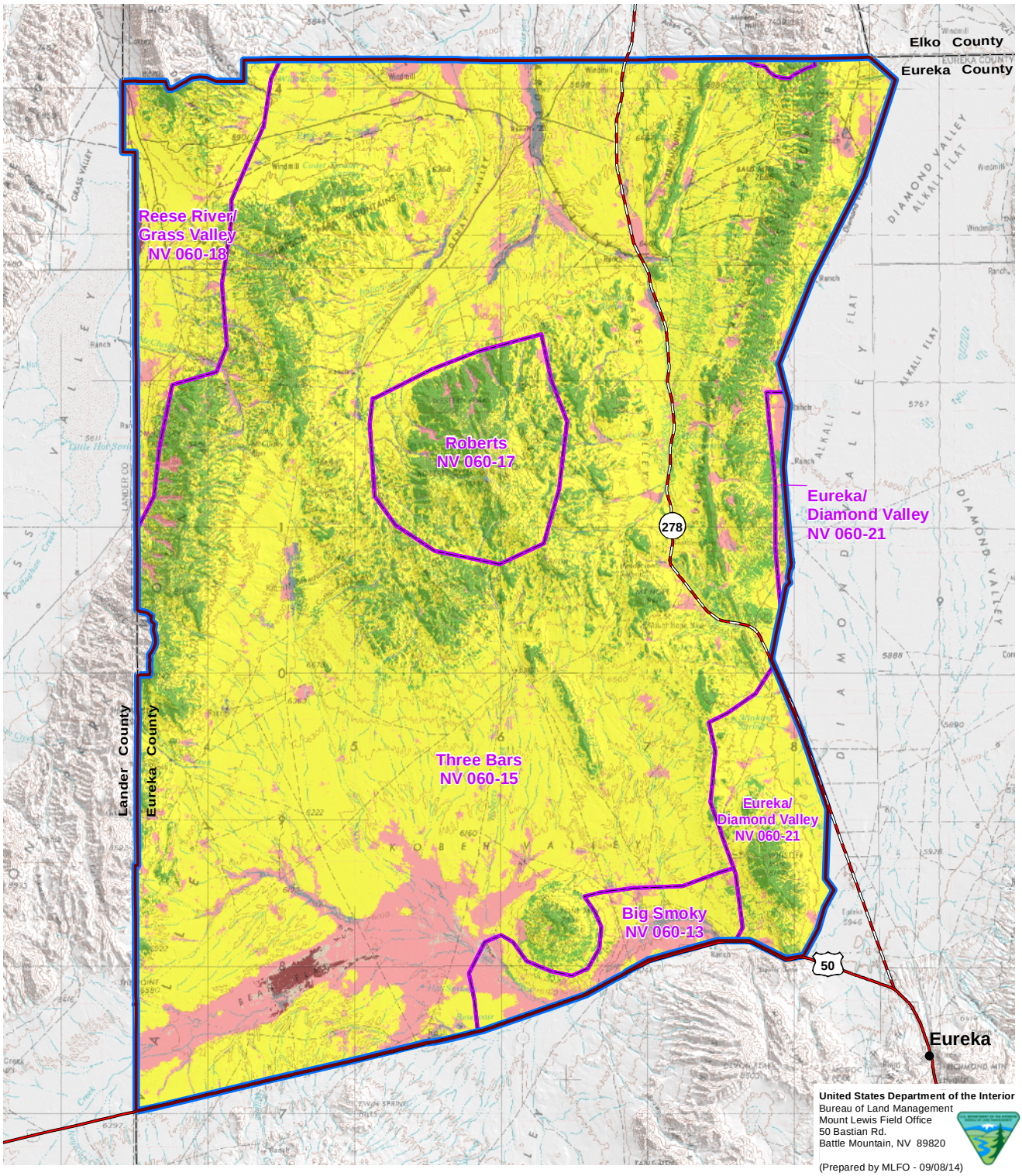
Source: BLM 2012f,g.

3 Bars Ecosystem and Landscape Restoration Project

Figure 3-33

Fire History and Occurence

0 1 2 3 4 5 10 Miles
0 1 2 3 4 5 10 Kilometers
N



Legend

Natural Fire Regimes

- Fire Regime Group III
- Fire Regime Group V
- Fire Regime Group IV
- Barren
- Sparsely Vegetated
- Indeterminate Fire Regime Characteristics
- Fire Management Unit
- 3 Bars Project Area

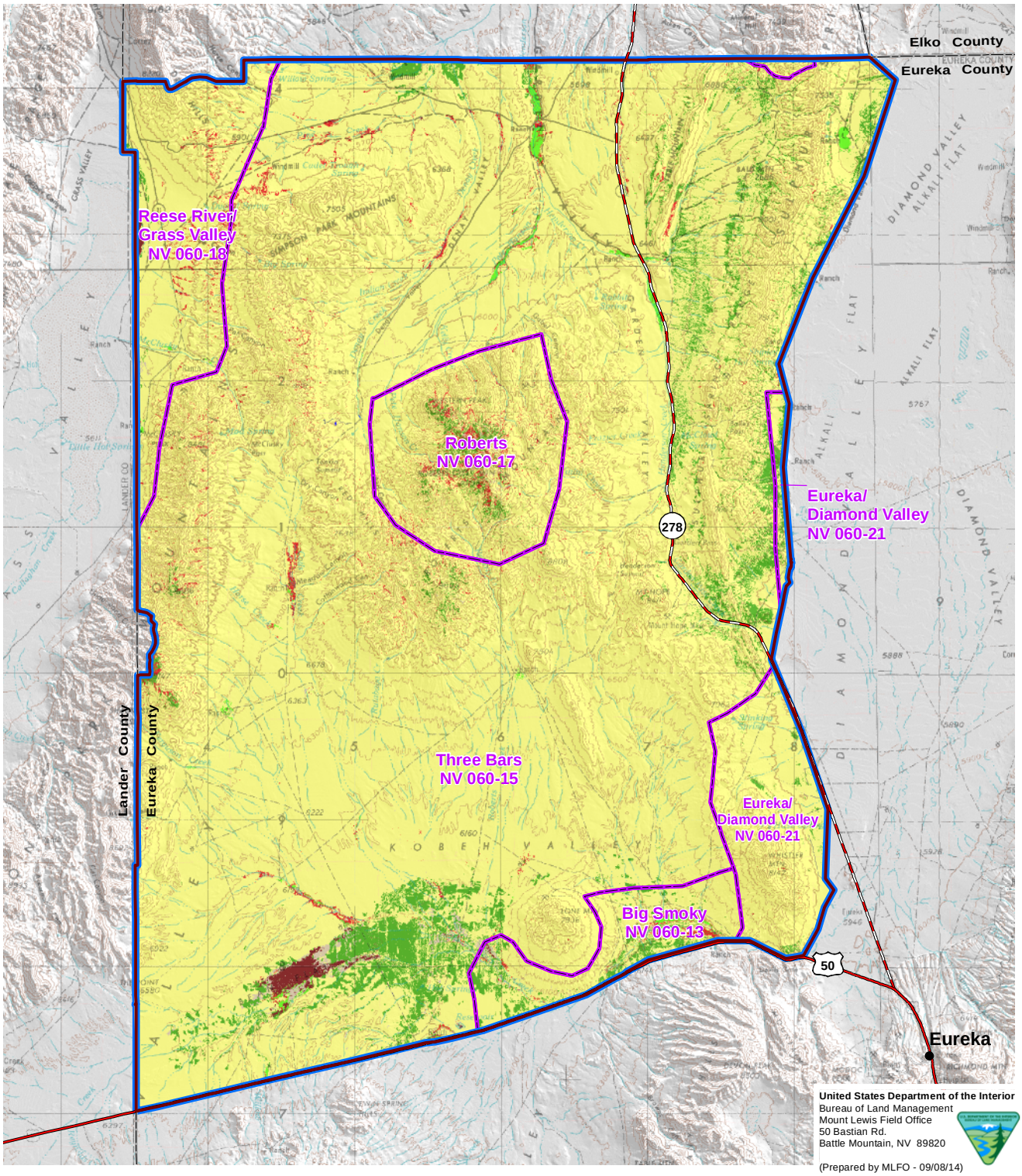
Source: BLM 2012g.

3 Bars Ecosystem and Landscape Restoration Project

Figure 3-34

Natural Fire Regimes

0 1 2 3 4 5 10 Miles
0 1 2 3 4 5 10 Kilometers
N



Legend

Current Fire Regime Condition Classes

- Condition Class 1
- Condition Class 2
- Condition Class 3
- Agriculture
- Barren
- Sparsely Vegetated
- Fire Management Unit
- 3 Bars Project Area

Source: BLM 2012g.

3 Bars Ecosystem and Landscape Restoration Project

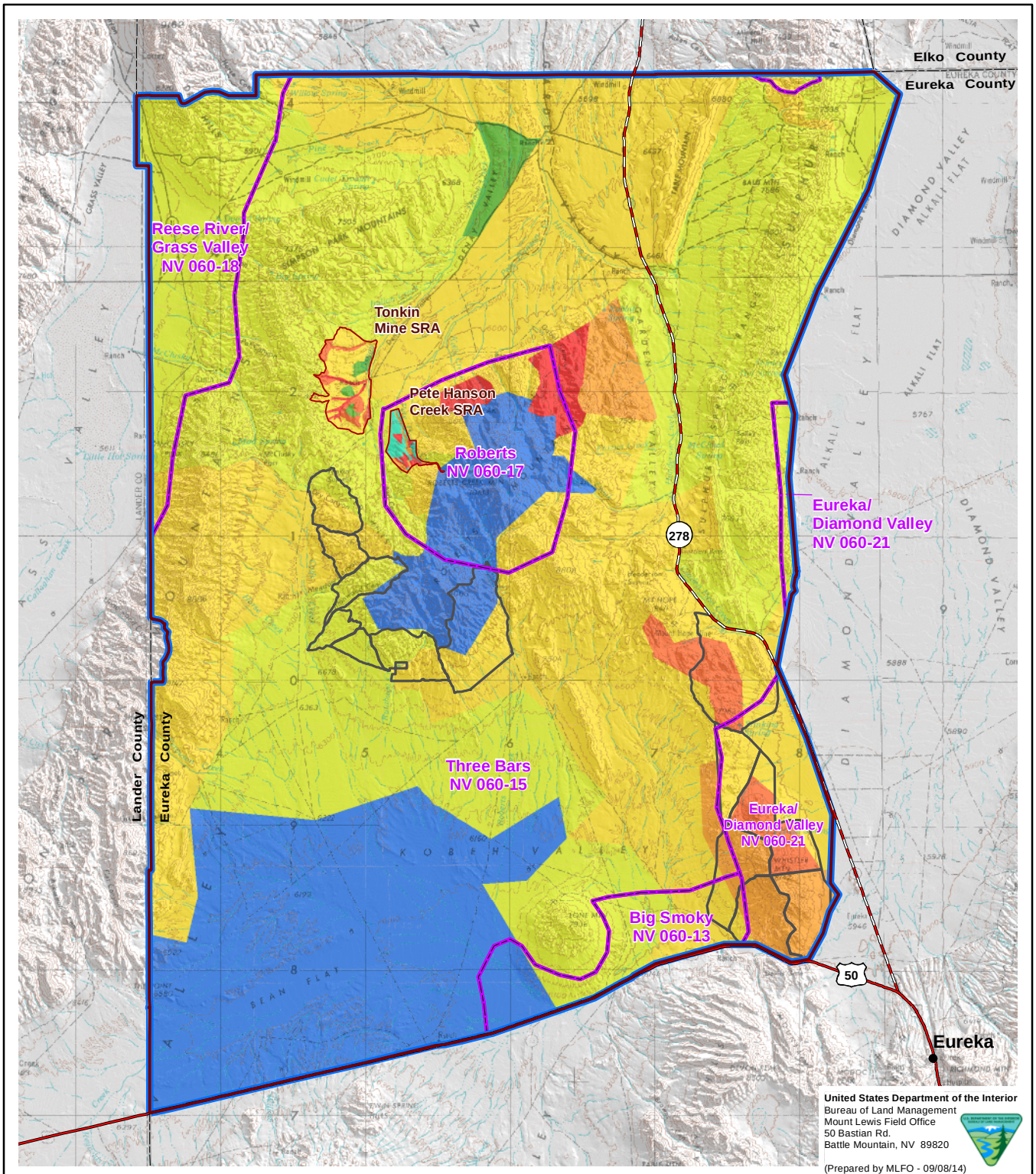
Figure 3-35

Current Fire Regime Condition Classes

0 1 2 3 4 5 10 Miles

0 1 2 3 4 5 10 Kilometers

N



Legend

Fire Risk

- Low to Moderate
- Moderate
- Moderate to High
- High
- High to Very High
- Very High
- Very High to Extreme
- Extreme

- Current Identified "Strategic Areas" Site/Risk Assessment
- Strategic Areas - Ongoing Assessments
- Fire Management Unit
- 3 Bars Project Area

Source:BLM 2009a,f, 2012g.

3 Bars Ecosystem and Landscape Restoration Project

Figure 3-36

Current Risk of Catastrophic Fire and Threat to Resource Values

0 1 2 3 4 5 10 Miles
0 1 2 3 4 5 10 Kilometers
N

TABLE 3-40

Fire History on the 3 Bars Project Area

Year	Number of Fires	Total Acres Burned	Year	Number of Fires	Total Acres Burned
1985	9	18,164	1999	16	74,164
1986	4	12	2000	11	1,396
1987	1	0	2001	14	10
1988	4	652	2002	12	6
1989	7	0	2003	15	31
1990	10	0	2004	6	2
1991	5	1	2005	21	227
1992	8	10	2006	8	909
1993	2	0	2007	7	52
1994	13	2,074	2008	7	172
1995	12	329	2009	0	0
1996	10	2,009	2010	1	1,208
1997	4	2	2011	4	71
1998	8	2,540	2012	1	12,073

TABLE 3-41

Fire Regime Descriptions (Historical Fire Regimes)

Group	Frequency	Severity	Severity Description	Number of Acres in Project Area
I	0 – 35 years	Low/mixed	Generally low-severity fires replacing less than 25 percent of the dominant overstory vegetation; can include mixed-severity fires that replace up to 75 percent of the overstory.	0
II	0 – 35 years	Replacement	High-severity fires replacing greater than 75 percent of the dominant overstory vegetation.	0
III	35 – 200 years	Mixed/low	Generally mixed-severity; can also include low-severity fires.	102,000
IV	35 – 200 years	Replacement	High-severity fires.	576,750
V	200+ years	Replacement/any severity	Generally replacement-severity; can include any severity type in this frequency range.	71,250

Estimated from LANDFIRE database.

TABLE 3-42

Fire Regime Condition Class Descriptions

Condition Class	Fire Regime	Risk of Losing Key Ecosystem Components	Vegetation Attributes	Acres in 3 Bars Project Area
I	Fire regimes are within historical range.	Risk of losing key ecosystem components is low.	Vegetation attributes are intact and function within an historical range.	45,000
II	Fire regimes on the land have been moderately altered from historical ranges. Fire return intervals have increased or decreased from historical frequencies by 1 or more return intervals, resulting in moderate changes to: • The size, frequency, intensity, or severity of fires; or • Landscape patterns.	There exists a moderate risk of losing key ecosystem components from fire.	Vegetation attributes have been moderately altered from the historical range of attributes.	625,000
III	Fire regimes on the land have been significantly altered from historical ranges. Fire return intervals have increased or decreased from historical frequencies by multiple return intervals, resulting in dramatic changes to: • The size, frequency, intensity, or severity of fires; or • Landscape patterns.	There exists a high risk of losing key ecosystem components from fire.	Vegetation attributes have been significantly altered from the historical range of attributes.	52,500

Estimated from LANDFIRE database.

3.14.2.4 Resource Management Plan Amendments for Fire Management

In 2002, the BLM prepared an amendment to the Shoshone-Eureka RMP in order to address fire management. Under the Shoshone-Eureka Fire Land Use Plan Amendment Decision Record, the BLM decided to improve fire management within the planning area by restoring fire as an integral part of the ecosystem, improving the diversity of vegetation, and reducing fire fuel hazards. This would be accomplished through the use of prescribed fire and fire use for resource benefit, and by using mechanical treatments such as green strips, shaded fuel breaks, and tree thinning to reduce wildfire fuel hazards. By taking these actions, it was expected that the size and severity of future wildfires would be reduced (USDOI BLM 2002:1, 9). This amendment was developed in response to the 1999 wildfire season, when 279,990 acres burned within the Battle Mountain District, substantially more acres than the average of 5,900 acres that burned annually during the previous 10 years.

In the amendment, the BLM developed fire management categories, ranging from wildland fire not appropriate and full suppression with an aggressive initial attack is recommended (Category A), to wildland fire is appropriate and there are no constraints (Category D). Under the fire management plan, most of the 3 Bars Project area dominated by pinyon-juniper vegetation was categorized as Category C. Under Category C, wildland fire is appropriate, but there are constraints on its use. In Category C areas, prescribed fire use tends to be site-specific and is designed to accomplish protection or improvement goals, and the desired future condition is a healthy ecosystem characterized by a good distribution and proportion of successional stages that would occur over time under a natural fire regime. The remainder of the 3 Bars Project area was categorized as Category B. Under this category, unplanned fire is likely to cause negative effects, but these effects may be mitigated through fuels management. Prescribed fire has limited use and mechanical treatments are normally preferred (USDOI BLM 2002:10, 12).

3.14.2.5 Fire Management Plan

The purpose of the 2004 Fire Management Plan is to identify and integrate all wildland fire management guidance, direction, and activities required to implement national fire policy, the National Fire Plan, the Healthy Forest Restoration Act, and the Healthy Forest Initiative. The Fire Management Plan also reflects and integrates fire management direction from the Shoshone-Eureka RMP, and the Shoshone-Eureka Fire Land Use Plan Amendment.

Management direction allows for fire to be restored as an integral part of the ecosystem to meet resource management objectives on BLM-administered lands. The Fire Management Plan identifies and directs fire strategies to provide for firefighter safety, the protection of human life, and the safeguarding of private property through aggressive fire protection, reduction of hazardous fuels, and restoration of fire-damaged ecosystems.

Fire Management Plan Objectives

The Fire Management Plan identifies numerous objectives for managing fires in the project area. These include:

- Protection of human life, safety of wildland firefighters, and protection of human safety and health.
- Protection of private property and natural and cultural resources, including preventing the destruction of cultural properties from suppression actions.
- Protection of communities and associated infrastructure.
- Providing for vegetative and ecological diversity.
- Protection of important wildlife habitat from devastating wildland fire effects.
- Protection of all fisheries, including existing and historical Lahontan cutthroat trout habitats.
- Protection of HMA foaling areas during foaling seasons.
- Providing for vegetative and ecological diversity.
- Protection of important raptor nesting habitat.
- Protection of riparian zones from devastating wildland fire effects.
- Restoring fire as an integral part of the ecosystem.
- Using mechanical treatments to reduce wildfire fuel hazards.

- Fire is considered a natural and desirable element in WSAs. Interim guidance directs BLM to rely on methods least damaging to wilderness values, and to limit surface disturbance to the protection of life and private property. All WSAs are managed as Visual Resource Management Class I areas.
- Rehabilitation and restoration of all wildfires 300 acres or larger.

In addition, the Fire Management Plan identifies several objectives for managing prescribed fires in the project area. These are:

- Utilize prescribed fire to mitigate hazardous fuels to acceptable levels.
- Utilize prescribed fire to promote resource management to maintain the natural component of the ecosystem and restore fire as an integral part of the ecosystem.
- Utilize wildland fire for resource benefit to maintain important habitat and restore fire as an integral part of the ecosystem as approved by site-specific activity level document.
- Restore pinyon pine and juniper woodland density and coverage to the approximate values found under natural fire return intervals.

3.14.2.6 Fire Management Units

As discussed in the Fire Management Plan, the BLM has divided the Battle Mountain District into Fire Management Units (FMUs). A FMU is a specific land management area that is defined by fire management objectives, management constraints, topographic features, access, values to be protected, political boundaries, fuel types, and/or major fire regime groups. The Battle Mountain FMUs are scaled to best define predominate fire management objectives, physical characteristics, resource values, and fire planning attributes, including for lands within the 3 Bars Project area (USDOI BLM 2004a).

The 3 Bars Project area is part of five FMUs—Big Smoky (NV-060-13), Three Bars (NV-060-15), Roberts (NV-060-17), Reese River/Grass Valley (NV-060-18), and Eureka/Diamond Valley (NV-060-21; **Figure 3-35**). The following summarizes information from the 2004 Fire Management Plan.

3.14.2.6.1 Big Smoky (NV-060-13)

The Big Smoky FMU lies between the Toiyabe Mountain Range to the west, and the Toquima Mountain Range to the east. The FMU is 407,715 acres, of which 96 percent of acres are administered by the BLM; 19,758 acres are within the project area. Most of the vegetation is salt-desert shrub, but some sagebrush pockets exist. During 1980 to 2003, the average wildfire size was less than an acre and nearly all wildfires were started by lighting, with a few fires started by humans.

Wildfires typically occur during May through October. Temperatures during the fire season typically range from the mid-80s to the upper 90s °F with relative humidity typically in the teens or single digits. Summer thunderstorms bring frequent lightning and can bring brief, heavy rains. Occasionally, dry or isolated thunderstorms plague the District with multiple ignitions.

Fire is an uncommon component of salt-desert shrub ecosystems as is abundant fine fuel loadings. Wind-driven fires in the sagebrush can advance with high rates of spread and can cover vast distances quickly. Fires in the salt-desert shrub vary in intensity and are highly dependent on the presence of fine fuels. The presence of cheatgrass can

dramatically shorten fire return intervals in all vegetative communities and cause fires to spread very quickly, but very little cheatgrass has been seen in this FMU. Live fuel moisture, pathogens, relative humidity, wind, and slope will greatly influence fire behavior in these desert fuel types.

The salt-desert scrub communities are Fire Regime IV and FRCC I. The sagebrush/grass communities are Fire Regime II and FRCC II.

3.14.2.6.2 Three Bars (NV-060-15)

The Three Bars FMU is in Lander and Eureka Counties and is 880,852 acres; approximately 618,601 acres are within the project area. The FMU is bound on the west by Grass Valley, on the south by the U.S. Highway 50, on the east by Diamond Valley, and on the north by the District Boundary. U.S. Highway 50 and State Highway 278 provide the primary access to this FMU. Over 97 percent of this FMU is administered by the BLM. The unit is rated as having high value habitat, with over 85 percent of vegetation comprised of pinyon-juniper and sagebrush. During 1980 to 2003, the average wildfire size was about 300 acres and nearly all wildfires were started by lighting, with a few fires started by humans.

Wildland fires typically occur during May through September. Maximum temperatures for this FMU rarely exceed 100 °F during this period. Frequent lightning storms bring moderate amounts of precipitation occur throughout the summer.

Fire behavior differs in the three fuel types found in this FMU. Fires in sagebrush, which is the dominant fuel type, historically were medium sized and of mixed severity. Recent sagebrush fires in this FMU have been medium-sized fires but of high severity. Fires in pinyon-juniper stands are characterized by either single tree/small group fires or large, stand-replacing events. Salt-desert shrub fires typically only burn under severe conditions (i.e., high wind, low relative humidity, and with abundant fine fuel loading). Fire is a relatively uncommon component of salt-desert shrub fuel types. Living vegetation fuel moisture, pathogens, relative humidity, fine fuels, wind, and slope will greatly influence fire behavior in these fuel types. Fires in the sagebrush and salt-desert shrub types are generally easier to suppress than fires in the pinyon-juniper type.

The pinyon-juniper and sagebrush types are in Fire Regime II and FRCC II.

3.14.2.6.3 Roberts (NV-060-17)

The Roberts FMU consists of 39,192 acres in the Roberts Mountains of Eureka County, and these acres are within the project area. State Highway 278 and the Alpha Road provide the primary access to this FMU. One hundred percent of this FMU is administered by the BLM. The unit is rated as Special Management Area, with vegetation comprised mostly of pinyon-juniper, mountain shrub, and sagebrush. During 1980 to 2003, the average wildfire size was about 3 acres and nearly all wildfires were started by lighting.

Wildfires typically occur during May through September. Maximum temperatures for this FMU rarely exceed 100 °F during this period. Frequent lightning storms bring moderate amounts of precipitation during the summer.

Fire behavior differs in two main fuel types. Fires in the pinyon-juniper type are characterized by either single tree/small group fires or large stand replacing events. Fires in the sagebrush type are historically characterized by medium-sized fires of mixed severity. Lately, the trend has been medium- to large-sized fires of moderate to high severity. Living vegetation fuel moisture, pathogens, relative humidity, fine fuels, wind, and slope will greatly

influence fire behavior in these fuel types. Fires in sagebrush are generally easier to suppress than fires in the pinyon-juniper type.

The pinyon-juniper type and sagebrush type are in Fire Regime II and FRCC II.

3.14.2.6.4 Reese River/Grass Valley (NV-060-18)

The Reese River/Grass Valley FMU lies in the northern portion of the District and is 843,149 acres; only a portion of the FMU is in the project area (40,501 acres). The portion of the FMU in the project area is bordered by U.S. Highway 50 on the south and the Dry Hills and the Cortez Mountains on the east. This FMU in the project area is administered by the BLM. Much of the unit contains cheatgrass. Fires are often quite large (greater than 1,000 acres) and are started by lighting and human causes.

Wildfires typically occur during May through October. Wind driven fires in the sagebrush can advance with high rates of spread and can cover vast distances quickly. Fires in the salt-desert shrub vary in intensity and are highly dependent on the presence of fine fuels. Fire is an uncommon component of salt-desert shrub ecosystems as are abundant fine fuel loadings. Areas where cheatgrass have invaded are at the highest risk for fire. The presence of cheatgrass can dramatically shorten fire return intervals in all vegetative communities and cause fires to spread very quickly. Living vegetation fuel moisture, pathogens, relative humidity, wind, and slope will greatly influence fire behavior in these fuel types.

The vast majority of the FMU occurs in valley locations. In these areas, diurnal winds and temperatures can vary greatly. These areas can experience 180-degree changes in slope and valley winds. Additionally, these locations are prone to intense heating (heat sinks) during the day and rapid cooling at night. Generally cool air flows to the lowest elevations at night, which are typically the valley locations. The mountains and valleys are aligned southwest to northeast, which is in concert with the typical prevailing wind direction. This FMU has a history of having large wildfires, most recently, the wildfires of 1999. The 1999 Antelope fire burned nearly 100,000 acres. Thunderstorms have been responsible for erratic and rapid fire spread during past fire events.

The sagebrush type is in Fire Regime II and FRCC III, and the salt-desert shrub communities are in Fire Regime IV and FRCC III.

3.14.2.6.5 Eureka/Diamond Valley (NV-060-21)

The Eureka-Diamond Valley FMU is 243,330 acres in Eureka County in the southern end of Diamond Valley; 30,573 acres are within the project area. The FMU is bound on the east by the Diamond Mountain Range, on the west by the Mountain Boy Range, on the north by Alkali Flat, and the south by the Fish Creek Range. U.S. Highway 50 and State Route 278 provide the primary access to this FMU. Seventy-nine percent of this FMU is administered by the BLM, while 20 percent is privately owned. The unit is rated as Wildland Urban Interface, with 74 percent of vegetation comprised of pinyon-juniper, mountain shrub, and sagebrush, and 20 percent not having significant vegetation. During 1980 to 2003, the average wildfire size was about 500 acres and most wildfires were started by lighting.

Wildfires typically occur May through September. Maximum temperatures for this FMU rarely exceed 90 °F during the same period. Frequent lightning storms bring moderate to heavy amounts of precipitation during the summer.

Fires in the pinyon-juniper type are characterized by either single tree/small group fires or large stand replacing events. Fires in the sagebrush type are historically characterized by medium-sized fires of mixed severity. Living vegetation

fuel moisture, pathogens, relative humidity, fine fuels, wind, and slope will greatly influence fire behavior in both of these fuel types. Diamond Valley is a heat sink for this FMU and could significantly alter fire behavior.

The pinyon-juniper type and sagebrush types are in Fire Regime II and FRCC II.

3.14.3 Environmental Consequences

3.14.3.1 Key Issues of Concern Considered during Evaluation of the Environmental Consequences

The following fire management issues were identified by the public during scoping:

- Concern that the BLM thinks it can impose fire and other treatments to restore the historical ranges of fire occurrence and achieve an artificially desired future condition.
- Fuels reduction should only occur in the wildland-urban interface or where there is a threat of significant wildfire.
- Assess whether seeding crested wheatgrass, grazing, and high stocking rates may result in more extensive and larger acreage fires.
- The BLM should develop a methodology to prioritize any treatments of hazardous fuels.
- The BLM needs to provide a full accounting of all fuels/fire/habitat projects conducted by the District in the past 10 years.

3.14.3.2 Significance Criteria

Impacts from the alternatives would be considered significant if they caused 1) a change from a lower FRCC to a higher FRCC (e.g., from FRCC I to FRCC II or FRCC II to FRCC III), 2) an increase in risk of loss of life or property from wildland fire, or 3) an increase in the risk of a catastrophic wildfire.

3.14.3.3 Direct and Indirect Effects

3.14.3.3.1 Direct and Indirect Effects Common to All Action Alternatives

Adverse Effects

In general, proposed treatments would have few adverse impacts on wildfire risk. It is possible that the use of vehicles to transport workers to the treatment site, or use of chainsaws or other gas-powered equipment could cause a spark that results in a wildfire. Vehicles could also transport noxious weeds and other invasive non-native vegetation seeds and vegetative parts from a treatment site to other 3 Bars Project areas, resulting in noxious weeds and other invasive non-native vegetation spread and increased risk of wildfire. However, these risks would be minor as transport vehicles would contain fire extinguishers and other fire suppression equipment and would generally remain on roads. If slash or other woody material from woodland treatments were not disposed of properly, they could serve as an ignition source for a wildfire. To reduce this risk, felled trees would be disposed of by using trees for posts or as mulch, by selling trees for commercial use, by placing logs in streams to slow water flow, or by burning piles or slash.

Beneficial Effects

Treatments that remove hazardous fuels from public lands would be expected to benefit the health of plant communities in which natural fire cycles have been altered. Fire suppression leads to the buildup of unhealthy and dead plant materials (e.g., litter and dead woody materials), and often increases the density of flammable living fuels on a site (e.g., dead branches on living shrubs or live plants, especially during dry periods) that can lead to crown fires (Cochrane et al. 2012). The resultant fires burn hotter, spread more quickly, and consume more plant materials than historical wildfires that occurred under conditions of lower fuel loading. In addition, human-caused wildland fires occur with greater frequency than they historically did, resulting in altered plant community structure. Treatments that restore and maintain fire-adapted ecosystems, through the appropriate use of mechanical thinning, fire use, and other vegetation treatment methods, would decrease the effects from fire to communities and improve ecosystem resilience and sustainability (USDOI BLM 2007c:4-53).

Creating and maintaining fire and fuel breaks would be a common objective of many of the treatments proposed on the 3 Bars ecosystem. This includes creating green strips and shaded fuel breaks to compartmentalize wildland fire and reduce the risk of a catastrophic wildfire. The BLM would use existing barriers/breaks to halt fire spread to the extent practicable, and use thinnings and plantings adjacent to barriers/breaks to enhance their effectiveness. Fire and fuel breaks would be created or enhanced under all alternatives, and would primarily be created using manual and mechanical methods.

3.14.3.3.2 Direct and Indirect Effects under Alternative A (Preferred Alternative)

Under Alternative A, the BLM would meet FMU objectives under the Fire Management Plan (USDOI BLM 2004a). The BLM would be able to reduce hazardous fuels, and create fire and fuel breaks to slow the spread of a wildfire. Because about 17 percent of the 3 Bars Project Area would be treated during the next 10 to 15 years, and nearly all proposed treatments would provide some benefit toward hazardous fuels reduction, the BLM estimates that the FRCC on about 95,000 acres would improve over the next 10 to 15 years under Alternative A.

Riparian Treatments

Adverse Effects

Prescribed fire treatments could jump fire boundaries and burn a larger area than planned. In addition, seeding may be needed, and livestock would need to be kept off of treated areas for at least 2 growing seasons after a prescribed fire, to promote the development of native forage and give forage ample time to recover (USDOI BLM 2007c:4-96).

Beneficial Effects

Riparian treatments would help to reduce the risk of wildfire by reducing hazardous fuels and restoring natural fire regimes in riparian zones. Manual and mechanical treatments would help restore and enhance riparian function, and improve the ability of streams and associated riparian, wetland, and floodplain habitat to serve as a fuel break. At Hash Spring and several other springs, and at project sites where Lahontan cutthroat trout habitat improvements would occur, the BLM would improve riparian habitat by removing pinyon-juniper using manual and mechanical methods or prescribed fire. Most pinyon-juniper removal would occur adjacent to roads or other fire breaks, or to create or enhance fuel breaks adjacent to riparian zones. Fuel and fire breaks would help to control the spread of wildfires.

Aspen Treatments

Some slash from pinyon-juniper treatments would be left in place to promote aspen suckering and seedling establishment, or to act as deadfall to limit livestock, wild horse, and other wild ungulate movement onto treatment areas. This woody material could provide fuel for a wildfire until it decomposes. However, this risk would be minimized by gathering up excess material and selling it to the public, or pile/slash burning the material.

Actions that stimulate or enhance aspen suckering and sucker survival should improve the health of aspen stands, and, long-term, reduce the amount of dead and decaying vegetation in these stands that could provide fuel for a wildfire.

Pinyon-juniper Treatments

Adverse Effects

On the Lone Mountain area of Kobeh Valley, trees would be thinned primarily by using chainsaws. Downed trees and other woody material could serve as fuel for a wildfire. Slash from chainsaw treatments in late Phase II and Phase III woodlands can create a fire hazard for at least 2 years, and may open sites for introduction of invasive plant species (Tausch et al. 2009). Woody material from shredding treatments can also contribute to available fuels and often creates favorable conditions for noxious weeds and other invasive non-native species (Gottfried and Overby 2011).

On the Atlas, Frazier, and several other units, pinyon-juniper would be removed using manual and mechanical treatments. If not disposed of properly, uprooted and downed trees and slash could provide fuels for a wildfire and serve as a conduit for carrying a wildfire between valley and mountain areas. To reduce this risk, felled trees would be used for posts or mulch, sold for forest products use, placed in streams to slow water flow, or burned in piles or as slash.

Fire treatments could expose bare soil and allow noxious weeds and other invasive non-native vegetation, such as cheatgrass, to establish and spread. The BLM has conducted monitoring at prescribed fire treatment areas, and has found that noxious weeds and other invasive non-native vegetation may be found at treatment sites post-burn. At the Red Hills site, for example, very low to low densities of cheatgrass were seen at about half of the monitoring stations 1 year after the burn, especially in areas of high-severity burning (USDOI BLM 2008i). As of 2013, cheatgrass is still present in the Red Hills project, but its coverage is very spotty across the landscape both in where it occurs and how much occurs. No monitoring of the site was done in 2013, but monitoring is scheduled for 2014 (Lewis 2014).

Beneficial Effects

Manual, mechanical, and fire treatments in pinyon-juniper management areas would provide several benefits. Creating and enhancing fuel breaks in pinyon-juniper stands would break up the continuity of fuel, moderate fire behavior, and reduce the risk of loss of habitat and other resources from a catastrophic wildfire.

The BLM would place downed logs into streams to slow water flow. Logs should help to expand the size of streams where gradients are more gradual, and these stream features could also serve as fuel breaks to slow the spread of wildfire.

On the Cottonwood/Meadow Canyon, Dry Canyon, Three Bars Ranch, Tonkin North, and Whistler units, the focus of treatments would be on hazardous fuels reduction using manual and mechanical methods and prescribed fire. Much of the west slope of Roberts Mountains has not experienced a large-scale wildfire in over 100 years. These units have

been identified as having high to very high risk of catastrophic wildfire, or in the case of the Tonkin North and Whistler units, very high to extreme wildfire risk (**Figure 3-36**). These units have moderate amounts of standing dead and dead down wood, excessive surface litter, and a closed canopy that is conducive for a crown fire (USDOI BLM 2009a). By increasing canopy spacing among pinyon-juniper, the potential for a crown fire would be less, while residual trees would provide surface shading that lowers fuel temperatures (Tausch et al. 2009).

Monitoring at the Red Hills hazardous fuels reduction project, which included prescribed fire and mechanical treatments, showed that treatments helped to reduce hazardous fuels and wildfire risk. The risk of wildfire was reduced from a "very high to extreme" risk to "low" risk at 35 monitoring sites, and "low to moderate" risk at 5 sites. The FRCC Rating was II before the burn, and was "low II" after the burn. A variety of desirable forbs, grasses, and shrubs were observed re-colonizing treatment areas, and fuel breaks were still viable (USDOI BLM 2008i).

Pathogens and pests, including mistletoe, have led to unhealthy pinyon-juniper stands in the Tonkin North and South units and a build-up of hazardous fuels. The BLM proposes to remove up to half of the trees using manual and mechanical means and prescribed fire. These projects would enhance the health and resilience of pinyon-juniper woodlands and reduce the amount of hazardous fuels and wildfire risk. In recent years, the BLM has conducted hazardous fuels reduction treatments in the Tonkin Springs area using chainsaws, bull-hogs, and feller-bunchers, and created fuel breaks using a rotary mower (USDOI BLM 2005b).

The BLM would restore fire as an integral part of the ecosystem and reduce hazardous fuels on the Sulphur Spring Wildfire Management Unit by using wildland fire for resource benefit. Several wildfires have occurred in this area in recent years due to dense fuel accumulations and pinyon-juniper cover. In recent years, the BLM has used chainsaws, mowers/shredders, and prescribed fire to create fuel breaks and remove diseased pinyon-juniper (USDOI BLM 2009a). By reducing fuel accumulations and opening up the canopy cover, sagebrush and other shrub cover should increase, a more natural fire regime would be restored in the area, and the risk of future wildfires would be diminished.

Regardless of the cause of the fires in pinyon-juniper habitat, some post-burn restoration and management may be needed. After broadcast burns, the BLM may need to reseed burned areas with forbs, grasses, and shrubs. Based on past reseeding treatments conducted for several wildfire burns in the District, seeding and planting of native and non-native vegetation may have limited success, especially during drought years, and native release of seeds may be the primary mechanism for site revegetation. However, in areas with sufficient moisture, seedings have been successful and have resulted in an abundance and diversity of forbs, grasses, and shrubs (USDOI BLM 2011e). To ensure vegetation restoration success, the BLM may exclude livestock access to the area through grazing closure decisions, competed through a separate process. The BLM may also use small, temporary exclusion fencing, including electric fencing, which has been used effectively at wildfire restoration sites to improve revegetation success by excluding livestock, wild horses, and other wild ungulates (USDOI BLM 2009a, d, 2010e, f, g, h, i, j, 2011e, f).

The BLM would carefully monitor prescribed fire treatment sites to ensure that cheatgrass and other invasive non-native vegetation does not become established on these areas. In general, burns at lower elevations are more likely to have noxious weeds and other invasive non-native vegetation issues than treatments at higher elevations. Monitoring for the Red Hills hazardous fuels reduction project 1 year after prescribed fire and mechanical treatments showed evidence of cheatgrass in areas where severe burning occurred, but no cheatgrass or other noxious weeds and other invasive non-native vegetation in areas where burning was less severe (USDOI BLM 2008i). As of 2013, cheatgrass is still present in the Red Hills project, but its coverage is very spotty across the landscape both in where it occurs and how much occurs 5 years after treatment. No monitoring of the site was done in 2013, but monitoring is scheduled for

2014 (Lewis 2014). Cheatgrass and other noxious weeds and other invasive non-native vegetation can be controlled on wildland fire sites using herbicides, but it may take several years before this vegetation is brought under control (USDOI BLM 2011e, f).

Sagebrush Treatments

Adverse Effects

Where trees or sagebrush are left on the ground as slash, or piled, the potential for this material to serve as fuel for a wildfire exists. Pinyon-juniper trees would be disposed of by using trees for posts or mulch, selling trees, or placing them in streams. Treatments of noxious weeds and other invasive non-native vegetation would result in dead vegetation that could provide fuel for a hazardous wildfire until the site was restored using native vegetation or crested wheatgrass or forage kochia.

Beneficial Effects

At sites dominated by herbaceous or invasive species, such as the Rocky Hills and West Simpson Park units, the units could be treated using mechanical methods. The West Simpson Unit was burned during the 1999 Trail Canyon Fire, and has substantial cheatgrass cover and is in an area rated as high to very high for risk of a catastrophic wildfire. Cheatgrass is quite flammable during the summer, and efforts to eliminate it or slow its spread would help to reduce the risk of wildfire. Crested wheatgrass, forage kochia, and cheatgrass dominate the Rocky Hills Unit, and the unit has little sagebrush habitat. The BLM would use mechanical methods (discing and broadcast/drill seeding) to reduce herbaceous vegetation and promote the establishment of a native sagebrush community. The BLM may also use prescribed fire and biological control (livestock grazing) to also remove cheatgrass prior to seeding at the West Simpson Park Unit.

3.14.3.3.3 Direct and Indirect Effects under Alternative B (No Fire Use Alternative)

The risk of treatments causing a wildfire that spreads beyond treatment boundaries would be less under this alternative than Alternative A. Miles traveled by vehicles, the number of acres treated using manual and mechanical equipment, the amount of downed trees and slash material created, and the miles of fire and fuel breaks created would be similar between this alternative and Alternative A. Because the BLM would not use prescribed fire to treat vegetation under this alternative, there would be no risk of a prescribed fire spreading beyond treatment boundaries.

Without the use of prescribed fire and wildland fire for resource benefit, the BLM would be less likely to restore fire as an integral part of the ecosystem, reduce the risk of a large-scale wildfire, or reduce extreme, very high, and high wildfire risks to moderate risk or less than under Alternative A. About 8 percent of the 3 Bars Project area would be treated under this alternative. About 1,000 to 2,000 acres would be treated annually to reduce hazardous fuels, and the FRCC would be reduced on about 7,500 to 15,000 acres over the next 10 to 15 years. It is unlikely the trend toward large-sized fires of moderate to high severity in sagebrush and large stand-replacing fires in pinyon-juniper would slow or reverse in the long-term, however, and the BLM would still need an aggressive wildland fire prevention and control program for the long-term.

Treatments would help to meet some of the FMU objectives under the Fire Management Plan (USDOI BLM 2004a), but not to the same extent as they would under Alternative A. Manual and mechanical treatments would help to reduce hazardous fuels, protect and improve fish and wildlife habitat, and create fire and fuel breaks to slow the spread of a wildfire. Prescribed fire and fire for resource benefit are identified as important treatment options under

the Fire Management Plan for all FMUs, except the Big Smoky FMU, but would be unavailable to the BLM as a management tool under this alternative.

3.14.3.3.4 Direct and Indirect Effects under Alternative C (Minimal Land Disturbance Alternative)

This alternative focuses on the use of treatments that would have minimal ground disturbance. Recovery of vegetation through this more passive management approach is expected to take longer than under active management, where treatments such as seeding with native species, establishing intermediate vegetation to control erosion, and use of fire to reduce hazardous fuels, would be expected to promote faster recovery.

Under this alternative, there would be no wildland fire risks associated with the use of prescribed fire. The BLM would not use mechanical equipment (other than vehicles to transport work crews to treatment sites), so there would be no risk of a wildland fire being started by tractors, mowers, and other mechanical treatment equipment. However, workers would still use chainsaws and other hand-held power equipment that could cause a spark and start a wildland fire. Large numbers of workers and their vehicles would be needed to accomplish proposed treatments under this alternative. Vehicle miles traveled would likely be greatest under this alternative. Downed trees and slash material from treatments would be difficult to remove without mechanical equipment or pile/slash burning.

The number of miles of fire and fuel breaks created under this alternative would be less than under Alternatives A and B, as the BLM would not be able to use mechanical equipment, such as bulldozers, mowers, and mulchers, and prescribed fire to create fire and fuel breaks. Fire and fuel break treatments would primarily be limited to stream and aspen habitats, or near roads, where pinyon-juniper would be removed to enhance or create new breaks.

Alternative C would not restore fire as an integral part of the ecosystem, reduce the risk of a large-scale wildfire, or reduce extreme, very high, and high wildfire risks to moderate risk or less. Only about 500 to 1,000 acres would be treated annually to reduce hazardous fuels, and the BLM estimates that the FRCC would be reduced on only about 3,750 to 7,500 acres over the next 10 to 15 years, fewer acres than under Alternatives A and B.

The BLM would not meet FMU objectives under the Fire Management Plan (USDOI BLM 2004a). Manual treatments could be used to create a few miles of fuel breaks to slow the spread of a wildfire. Although the BLM could treat acreage using manual methods as proposed for each FMU, the BLM would not be able to conduct fire treatments as recommended in the Fire Management Plan to reduce hazardous fuels and the risk of a catastrophic wildfire in FMUs.

3.14.3.3.5 Direct and Indirect Effects under Alternative D (No Action Alternative)

There would be no direct effects to wildland fire from 3 Bars Project treatments as no treatments would be authorized under this alternative. Under this alternative, the BLM would not meet the fire use purposes to 1) restore fire as an integral part of the ecosystem, 2) reduce the risk of a large-scale wildfire, 3) reduce extreme, very high, and high wildfire risks to moderate risk or less, and 4) develop fuel breaks within treatment and adjacent areas. Threats to ecosystem health that could lead to catastrophic wildfire under this alternative would be associated with the ongoing expansion of noxious weeds and other invasive non-native vegetation; continued decline of ecosystem health due to further decline in native understory species in the upland plant communities; further expansion of pinyon-juniper woodland into other communities, including sagebrush, riparian, and aspen habitats; and an increase of fuel loads. There would be no improvement in the FRCC on the 3 Bars Project area and the BLM would not meet FMU objectives.

3.14.3.4 Cumulative Effects

The CESA for wildland fire is approximately 1.84 million acres and includes those watersheds at the Hydrologic Unit Code 10 level that are all or partially within the 3 Bars Project area (**Figure 3-1**). Approximately 92 percent of the area is administered by the BLM, 6 percent is privately owned, and 2 percent is administered by the Forest Service. Past and present actions that have influenced wildland fire activity in the 3 Bars ecosystem are discussed in Section 3.3.2.3.3.

3.14.3.4.1 Cumulative Effects under Alternative A (Preferred Alternative)

Historic overgrazing, introduction of cheatgrass, large wildfires, and other natural and human-caused factors have contributed to the departure of the plant communities from the Potential Natural Community across the 3-Bars ecosystem. This has led to a decrease in the functionality of ecological processes, thus reducing the resilience and resistance of these ecosystems to disturbance. The treatments proposed in the 3-Bars ecosystem are designed to provide the means needed for these ecosystems to recover.

In the short-term, small, temporary fences may change the distribution of grazing by livestock, wild horses, and wildlife. As distribution patterns change, utilization would also change. Utilization would decrease in treatment areas while temporary exclusion fences are in place, but would increase in other areas. Once the temporary exclusion fences are removed, animals may be attracted to the treatment areas resulting in potentially higher use of the area than before. Temporary exclusion fences would exclude livestock, although AUMs may be temporarily suspended to prevent overuse in other areas.

The BLM would continue to use ground-based herbicide applications to remove noxious weeds and other invasive non-native vegetation, and aerial-based application methods to remove cheatgrass, and would restore burned areas under the Burned Area Emergency Stabilization and Rehabilitation program, under existing authorizations on about 1,000 acres annually. These treatments could have a short-term adverse effect on non-target vegetation. These treatments would have long-term beneficial effects by helping to reduce hazardous fuels, improving native vegetation, slowing the spread of noxious weeds and other invasive non-native vegetation, and reducing surface runoff and erosion associated with burn sites on about 1,000 acres annually.

As discussed earlier, the BLM conducts fuel treatment projects under the direction of the Fire Management Plan. In addition to those areas identified under the proposed action, the BLM also proposes to treat hazardous fuels on an additional 8,300 acres in high to very high fire risk areas on and near the 3 Bars Project area. These include treatments in pinyon-juniper and sagebrush habitat using prescribed fire and manual and mechanical methods to remove pinyon-juniper, enhance wildlife habitat, and create fuel breaks.

Recreational use of the 3 Bars Project area increases the risk of a wildland fire due to accidental or intentional ignition of vegetation from a campfire, cigarette, hot vehicle muffler, or other human-caused ignition source. In addition, recreational users can spread noxious weeds and other invasive non-native vegetation that attaches to vehicles or to clothing or shoes, and can later cause new noxious weeds and other invasive non-native vegetation infestations and provide fuels for a wildland fire.

Land, mineral, oil, gas, geothermal, and other development would cause land disturbance and the spread of noxious weeds and other invasive non-native vegetation within the 3 Bars Project and nearby areas. Development would lead to additional human activity in the area, and increase the potential for a human-caused wildland fire. The BLM and

other fire-fighting agencies would have to contribute labor and equipment to protect developments from loss of human life and property from wildfire, instead of allowing these areas to burn naturally.

Hazardous fuels treatments would occur on about 142,000 acres (9 percent) of lands within the CESA. Although this would still be a small portion of lands within the CESA, treatments would be targeted toward public lands with high to very high wildfire risk. Given that over 90 percent of acres impacted by future actions are focused on hazardous fuels reduction and resource management, treatments would reduce wildfire risk long-term. At fire management treatment levels projected to occur in the CESA during the next 25 years under Alternative A, the BLM should meet the FMU objectives for most FMUs (USDOI BLM 2004a). The FRCC on about 142,000 acres would improve over the next 25 years.

3.14.3.4.2 Cumulative Effects under Alternative B (No Fire Use Alternative)

Under Alternative B, effects from non-3 Bars Project reasonably foreseeable future actions on wildfire would be similar to those described under Alternative A. The BLM anticipates treating about half as many acres under Alternative B as under Alternative A. Because the BLM would not use fire to treat vegetation on the 3 Bars Project area, the risk of a prescribed fire spreading beyond treatment boundaries would be less under this alternative than under Alternative A. However, the BLM would less able to restore fire as an integral part of the ecosystem; reduce the risk of a large-scale wildland fire; slow the spread of noxious weeds and other invasive and non-native vegetation; or reduce extreme, very high, and high wildfire risks to moderate risk or less under this alternative than under Alternative A on the 3 Bars Project area.

About 78,000 acres of vegetation would be treated to reduce hazardous fuels and improve rangeland health within the CESA, or about 4 percent of the CESA. This would include about 63,000 acres treated annually by the BLM on the 3 Bars Project area, and about 15,000 acres treated by the BLM on other areas within the CESA. Acres treated to reduce the FRCC under this alternative would be half that of Alternative A, and it is also less likely that the BLM would meet FMU objectives under the Fire Management Plan under this alternative than under Alternative A on the 3 Bars Project area.

3.14.3.4.3 Cumulative Effects under Alternative C (Minimal Land Disturbance Alternative)

Under Alternative C, effects from non-3 Bars Project reasonably foreseeable future actions on wildland fire would be similar to those described under Alternative A. The BLM anticipates treating about one-fourth as many acres under Alternative C as under Alternative A, mostly due to the higher costs associated with manual and classical biological control methods. The risk of treatments causing a wildland fire would be slightly less under this alternative than Alternative A. Because the BLM would not use fire to treat vegetation on the 3 Bars Project area, the risk of a prescribed fire spreading beyond treatment boundaries would also be less under this alternative than Alternatives A and B.

By not being able to use mechanical methods, such as mowing, chopping, tilling, discing, harrowing, and drill seeding, however, the BLM would do little to reduce hazardous fuels, create fire and fuel breaks, treat areas with noxious weeds and other invasive non-native vegetation, or remove downed wood and slash. Under Alternative C, the BLM would conduct fire management treatments on only about 2 percent of the CESA. This would include about 32,000 acres treated by the BLM to reduce hazardous fuels and wildfire risk on the 3 Bars Project area, and about 15,000 acres treated by the BLM elsewhere within the CESA. Only one-fourth as many acres would be treated to reduce the FRCC under this alternative as under Alternative A. It is also less likely that the BLM would meet FMU

objectives under the Fire Management Plan under this alternative than under Alternatives A and B on the 3 Bars Project area.

3.14.3.4.4 Cumulative Effects under Alternative D (No Action Alternative)

Under Alternative D, effects from non-3 Bars Project reasonably foreseeable future actions on wildland fire would be similar to those described under Alternative A. There would be no cumulative effects on wildfire from 3 Bars Project treatments as no treatments would be authorized under this alternative. The BLM could create fire and fuel breaks; thin and remove pinyon-juniper to promote healthy, diverse stands; slow the spread of noxious weeds and other invasive non-native vegetation, especially cheatgrass; restore fire as an integral part of the ecosystem; and reduce the risk of a large-scale wildfire, but on only about 1,500 acres annually under existing and reasonably foreseeable future authorizations.

Hazardous fuel levels would likely increase, and only a limited number of miles of fuel and fire breaks would be constructed under this alternative compared to the action alternatives. The trend toward large-sized fires of moderate to high severity in sagebrush, and large stand-replacing fires in pinyon-juniper, would likely increase. The BLM would do little to reduce the FRCC, and it is also less likely that the BLM would meet FMU objectives under the Fire Management Plan under this alternative than under the action alternatives on the 3 Bars Project area. Given the large number of utilities and infrastructure, mineral, oil, gas, geothermal, and other land developments that are reasonably foreseeable in the CESA, the need for an aggressive wildland fire prevention and control program to protect natural resources and public health and infrastructure could increase from current levels.

3.14.3.5 Unavoidable Adverse Effects

There is a risk, albeit small, of treatments causing a wildland fire. Although the BLM would implement SOPs to reduce this risk to near nil, it cannot be totally ignored. These risks include the potential for vehicles and manual and mechanical equipment to accidentally ignite a wildland fire. A prescribed fire or wildland fire for resource benefit could expand beyond treatment boundaries and become a wildland fire that could adversely impact natural and social resources. Treatments would result in the production of downed trees and other woody material that could become hazardous fuels. Workers and their vehicles could transport noxious weeds and other invasive non-native vegetation outside the treatment area, and this vegetation could become a hazardous fuel. Noxious weeds and other invasive non-native vegetation could also establish and spread in areas treated using prescribed fire and wildland fire for resource benefit.

3.14.3.6 Relationship between the Local Short-term Uses and Maintenance and Enhancement of Long-term Productivity

As discussed throughout this EIS, all restoration treatments would likely result in short-term uses and adverse effects, but if treatments are even modestly successful they would benefit land productivity long-term; wildland fire management treatments are no exception. Short-term uses have been discussed in other sections of this EIS, including the potential loss of vegetation, loss of use of woodland products, loss of fish and wildlife habitat, increase in noxious weeds and other invasive non-native vegetation, loss of rangeland for livestock and wild horse use, and loss of public use of lands for recreation, as a result of treatments to restore vegetation and other resources, reduce hazardous fuels, and reduce the risk of wildfire. Long-term, treatments to reduce the risk of wildfire should enhance the resilience and health of the landscape and land productivity, and reduce the risk of future wildfire and resultant loss of natural and

social resources. As discussed above, short-term uses and enhancement of long-term productivity would generally be in proportion to acres treated and methods used by the BLM.

3.14.3.7 Irreversible and Irretrievable Commitment of Resources

Fire management actions could result in an irretrievable loss of resources if they are lost for a period of time and cannot be replaced without reclamation. For example, prescribed fire could be used to treat unhealthy pinyon-juniper. If the burn is severe enough, native vegetation could be lost and replaced by cheatgrass. However, the site could be reclaimed with seedings and plantings of native vegetation. The fact that the BLM is proposing to restore a degraded landscape in the 3 Bars Project area suggests that the landscape is resilient, and that natural and man-made causes that have led to resource losses that can be corrected and retrieved over time.

Prescribed fire and wildland fire for resource benefit, and possibly manual and mechanical methods, used for hazardous fuels reduction and to reduce wildland fire risk could result in the loss of old-growth pinyon-juniper stands that could be considered by some to be irreversible, because it would take several hundred years before old growth stands would again occur on the site.

3.14.3.8 Significance of the Effects under the Alternatives

Treatment actions under all of the alternatives would not lead to a significant increase in wildland fire risk on the 3 Bars Project area and CESA. Treatments would help maintain or reduce the FRCC in treatment areas, reduce the risk of loss of life or property from wildland fire, and reduce the risk of a catastrophic fire. However, the alternatives would differ substantially in the magnitude of improvements, and whether restoration actions taken under an alternative would be effective in lowering overall wildland fire risks within the 3 Bars ecosystem.

Substantially more acres within the CESA would be treated under Alternative A than the other alternatives, and over the next 10 to 15 years about 17 percent of the acreage on the 3 Bars Project area would be treated under this alternative. Thus, the potential for meaningful improvement in the landscape is greatest under this alternative. Under Alternative A, the potential for loss of life or property from wildland fire on the 3 Bars Project area would probably remain little changed from current conditions over the short-term, but should decrease long-term as fire return intervals in pinyon-juniper stands return to more natural cycles, hazardous fuels levels decrease, fire and fuel breaks are installed, and the landscape becomes more fire resilient. Although the change in overall FRCC would be slow, long-term it is likely that there would be a general shift in acreage from a higher FRCC to a lower one. It is also assumed that the risks of a catastrophic wildfire would decrease as resource conditions improve within the CESA due to fire management and other treatments under Alternative A.

Under Alternative B, the BLM would be limited to the use of manual, mechanical, and biological control methods and would treat about half as many acres (about 7,800 acres annually) within the CESA compared to Alternative A. Under this alternative, the potential for loss of life or property from wildland fire on the 3 Bars Project area would probably remain little changed from current conditions. The BLM would not be able to use prescribed fire and fire for resource benefit or herbicides to reduce hazardous fuels, but would be able to compartmentalize and slow the spread of wildland fire using manual and mechanical treatments to create fire and fuel breaks. Because fire would not be available to the BLM to help to restore nature fire cycles on the 3 Bars ecosystem, the ability of the BLM to improve ecosystem health and resiliency and reduce hazardous fuels would be limited.

Under Alternative C, the BLM would be limited to use of manual and classical biological control methods and would treat only about one-fourth the acreage treated under Alternative A. Treatments would primarily focus on riparian and aspen restoration and removal of pinyon-juniper in Phase I and II woodlands, and creation of fire and fuel breaks. Little hazardous fuels reduction or noxious weed and other invasive non-native vegetation control would occur, and fire and fuel break treatments would be limited to areas adjacent to roads and streams. The BLM would have limited ability to reduce the risk of a catastrophic fire and to control its spread, and risks of loss of life or property from wildfire within the CESA would likely increase long-term. Prescribed fire and fire for resource benefit would not be available to the BLM to help to restore nature fire cycles over portions of the 3 Bars ecosystem, and mechanical treatments would not be available for use to control or eliminate noxious weeds and other invasive non-native vegetation, create fire and fuel breaks, thin and remove pinyon-juniper that is encroaching into sagebrush habitat or is unhealthy, and to reseed disturbed areas. Thus, the ability of the BLM to improve ecosystem health and resiliency and reduce hazardous fuels would be more limited under Alternative C than under the other action alternatives.

3.14.4 Mitigation

No mitigation measures are proposed for wildland fire risk.

3.15 Fish and Other Aquatic Resources

3.15.1 Regulatory Framework

Several laws protect fish and other aquatic resources and their habitats. The Sikes Act of 1974 authorizes the USDOI to plan, develop, maintain, and coordinate programs with state agencies for the conservation and rehabilitation of wildlife, fish, and game on public lands. The Fish and Wildlife Conservation Act of 1980 encourages federal agencies to conserve and promote the conservation of non-game fish and wildlife species and their habitats.

3.15.1.1 Endangered Species Act

In accordance with Section 7 of the Endangered Species Act, federal agencies must "insure that any action authorized, funded, or carried out by such agency is not likely to jeopardize the continued existence of any listed species or result in the destruction or adverse modification of critical habitat of such species." The purpose of the Act is to provide a means for conserving the ecosystems upon which threatened and endangered species depend, and to provide a program for protecting these species. The Act defines an endangered species as a species that is in danger of extinction throughout all or a major portion of its range. A threatened species is defined as any species that is likely to become an endangered species within the foreseeable future throughout all or a major portion of its range. This Act also addresses species that have been proposed for listing as either threatened or endangered, but for which a final determination has not been made. Critical habitat is a specific area or type of area that is considered to be essential for the survival of a species, as designated by the USFWS under the Endangered Species Act. The Lahontan cutthroat trout is the only federally listed (threatened) species that occurs on the 3 Bars Project area.

3.15.1.2 Special Status Species

BLM Sensitive Species are defined as those plant and animal species for which population viability is a concern, as evidenced by: 1) significant current or predicted downward trend in population numbers or density, or 2) a significant current or predicted downward trend in habitat capability that would reduce the species' existing distribution. These species are protected under provisions of the Endangered Species Act or under the Nevada BLM sensitive status

(BLM Manual 6840, *Special Status Species Management*; USDOI BLM 2008h). In addition, there is a Nevada State Protected Animal List (Nevada Administrative Code 501.100 - 503.104) that the BLM has incorporated, in part, into the sensitive species list. No BLM sensitive aquatic species are known to occur within the project area.

3.15.1.3 BLM and Nevada Department of Wildlife Memorandum of Understanding

Wildlife and fish resources and their habitat on public lands are managed cooperatively by the BLM and NDOW under a Memorandum of Understanding as established in 1971. The Memorandum of Understanding describes the BLM's commitment to manage wildlife and fisheries resource habitat, and the NDOW's role in managing populations. The ecological definition of a population is a group of organisms of one species that interbreed and live in the same place at the same time. The BLM meets its obligations by managing public lands to protect and enhance food, shelter, and breeding areas for wild animals. The NDOW assures healthy wildlife numbers through a variety of management tools including wildlife and fisheries stocking programs, hunting and fishing regulations, land purchases for fish and wildlife management, cooperative enhancement projects, and other activities.

3.15.1.4 Nevada Department of Wildlife Programs

The NDOW is the state agency responsible for the restoration and management of fish and wildlife resources within the state. The NDOW administers state fish and wildlife management and protection programs as set forth in Nevada Revised Statute Chapter 501, Wildlife Administration and Enforcement, and Nevada Administrative Code § 503, Hunting, Fishing and Trapping; Miscellaneous Protective Measures. Nevada Revised Statute § 501.110 defines the various categories of fish and wildlife in Nevada, including protected categories. Nevada Administrative Code §§ 503.010-503.080, 503.110, and 503.140 list the fish and wildlife species currently placed in the state's various legal categories, including protected species, game species, and pest species.

3.15.2 Affected Environment

3.15.2.1 Study Methods and Study Area

Aquatic biological resources within the project area include fish and aquatic invertebrates and their habitat. Descriptions of fish and other aquatic resources were based on published and unpublished information regarding the types of aquatic habitat and their associated species or groups found in the 3 Bars Project area. Data sources used to identify habitat and aquatic species occurrences include the Mount Hope Project EIS and references cited therein (USDOI BLM 2012b), NDOW reports on fish populations and Lahontan cutthroat trout, the species management plan for the Lahontan cutthroat trout (Elliot 2004), and published reports of snails (SRK 2010). In addition, BLM and NDOW staff were contacted for information on fish and other aquatic resources on the 3 Bars Project area.

The study area for direct and indirect effects to aquatic biological resources includes streams, springs, and wetlands within the project area. The CESA for cumulative impacts to aquatic biological resources includes the Hydrologic Unit Code 10 watersheds wholly, or partially within, the project area, as shown in **Figure 3-1**.

3.15.2.2 Aquatic Habitat

The types of aquatic habitat that occur with the analysis area include perennial, intermittent, and ephemeral streams, springs, and wetlands. Perennial waterbodies contain water continuously during an average water year. Intermittent waterbodies contain water or flow on a sporadic or periodic basis, while ephemeral waterbodies contain water on a

short-term basis after precipitation events. The majority of the streams within the project area are intermittent/ephemeral.[2] In terms of stream lengths, the Pine Valley Basin contains the greatest number of miles of streams with perennial reaches. These streams include Birch, Denay, Henderson, Kelley, North Fork Pete Hansen, Pete Hansen, Vinini, and Willow Creeks (**Figure 3-22**). Of these streams, Henderson and Vinini Creeks contain the most perennial lengths, with 18.3 and 9.5 miles, respectively. Roberts Creek, with 8.4 miles, is the only stream in the Kobeh Valley Basin that contains perennial reaches. McClusky Creek (7.1 miles of perennial stream length) is the only perennial stream in the Grass Valley Basin that is within the 3 Bars Project area. Springs and wet areas are scattered throughout the project area. The majority of springs are found at higher elevations in the Simpson Park Range, on Roberts Mountains, and in the Sulphur Spring Range.

Aquatic habitat surveys were conducted in Birch and Pete Hanson Creeks as part of fish surveys in July 2009, and in 2011 in Willow Creek. These streams were selected for study due to the presence of Lahontan cutthroat trout, a federally listed threatened species under the Endangered Species Act. Based on the Habitat Condition Index, NDOW rated the stream reaches from poor to good in Birch and Pete Hanson Creeks, and fair to excellent in Willow Creek (NDOW 2009a, Starr 2011). The overall Habitat Condition Index rating was good in Birch and Willow Creeks and fair in Pete Hansen Creek. The Habitat Condition Index rating involved evaluating six parameters in the field, including pool abundance, pool structure, substrate stability, bank cover, soil stability, and bank vegetation stability. Downcutting of the stream channel exists in portions of Willow Creek (Starr 2011), but the downcut sections were not part of the Willow Creek habitat survey sites. Habitat information for these streams is provided in **Table 3-43.**

TABLE 3-43

Habitat Characteristics of Birch, Pete Hanson, and Willow Creeks

Stream	Discharge (cfs)[2]	Average Depth (feet)	Average Width (feet)	Substrate (%)		Bank Vegetative Cover (%)		
				Gravel	Rubble	Trees	Shrubs	Grasses/Forbs
Birch Creek	1.0-4.3	0.4	4.4	18	38	47	31	22
Pete Hanson Creek	1.0-4.3	0.4	4.4	44	28	19	36	45
Willow Creek	0.1-1.3	0.2	2.5	53	28	6	31	61

Cfs = cubic feet per second.
Source: NDOW (2009a), Starr (2011).

Stream assessments were conducted in Birch and Pete Hanson Creeks in 2001 for the purpose of evaluating the stream's ability to dissipate energy, protect banks, and minimize erosion (USDOI BLM 2012b, 2014). The streams' functioning condition was rated in qualitative terms using information about channel morphology, hydrology, soil, and vegetative parameters. Of the 5.4 miles of Birch Creek that were surveyed, conditions were rated as Proper Functioning Condition for 0.7 mile and Functional-at-risk Downward Trend for 0.4 mile. The remaining 4.3 miles

[2] The USGS does not distinguish between intermittent and ephemeral streams. The majority of streams classified as intermittent on the 3 Bars Project area do not have seasonal water, but only have water occasionally and would be classified as ephemeral.

were classified as an intermittent stream. Assessment results for 9.5 miles of Pete Hanson Creek were Proper Functioning Condition (5.3 miles), Functional-at-risk Upward (1.6 miles) Functional-at-risk Trend Not Apparent (1.3 miles) and Intermittent (1.3 miles). Assessment results for 5.8 miles of Willow Creek were Proper Functioning Condition (1.4 miles), Functional-at-risk Upward (1.6 miles), Functional-at-risk Trend Not Apparent (0.8 mile), and Non-functional (2.0 miles). Stream evaluations also were completed for other streams within the 3 Bars Project area. Several stream reaches did not meet the Proper Functioning Condition or Functional-at-risk Upward Trend including perennial streams such as Henderson, Vinini, Roberts, and McClusky Creeks. The NDOW conducted aquatic habitat surveys of Birch Creek and Pete Hanson Creek in 2009, and Willow Creek in 2011. Streambank stability, bank alteration, and erosion evaluations were completed for these streams in July 2010. The survey indicated that 73 percent of surveyed reaches had stable streambanks while 16 percent had active bank erosion, in Birch Creek. Similar results were observed in Pete Hanson Creek, where 74 percent of reaches surveyed had stable banks, while active bank erosion was observed on 15 percent of reaches. Bank alteration from livestock was estimated at 3 percent of the surveyed reach in Birch Creek and 4 percent of the surveyed reach in Pete Hanson Creek. Stable streambanks were found along 78 percent of surveyed reaches for Willow Creek (USDOI BLM 2014).

Based on public scoping comments, habitat conditions could be improved in project study area perennial streams that contain fish. The public recommended removal of fish barriers consisting of culvert and a large headcut on lower Roberts Creek, and habitat improvements on Birch, Pete Hanson, Vinini, Henderson, Roberts, and McClusky Creeks.

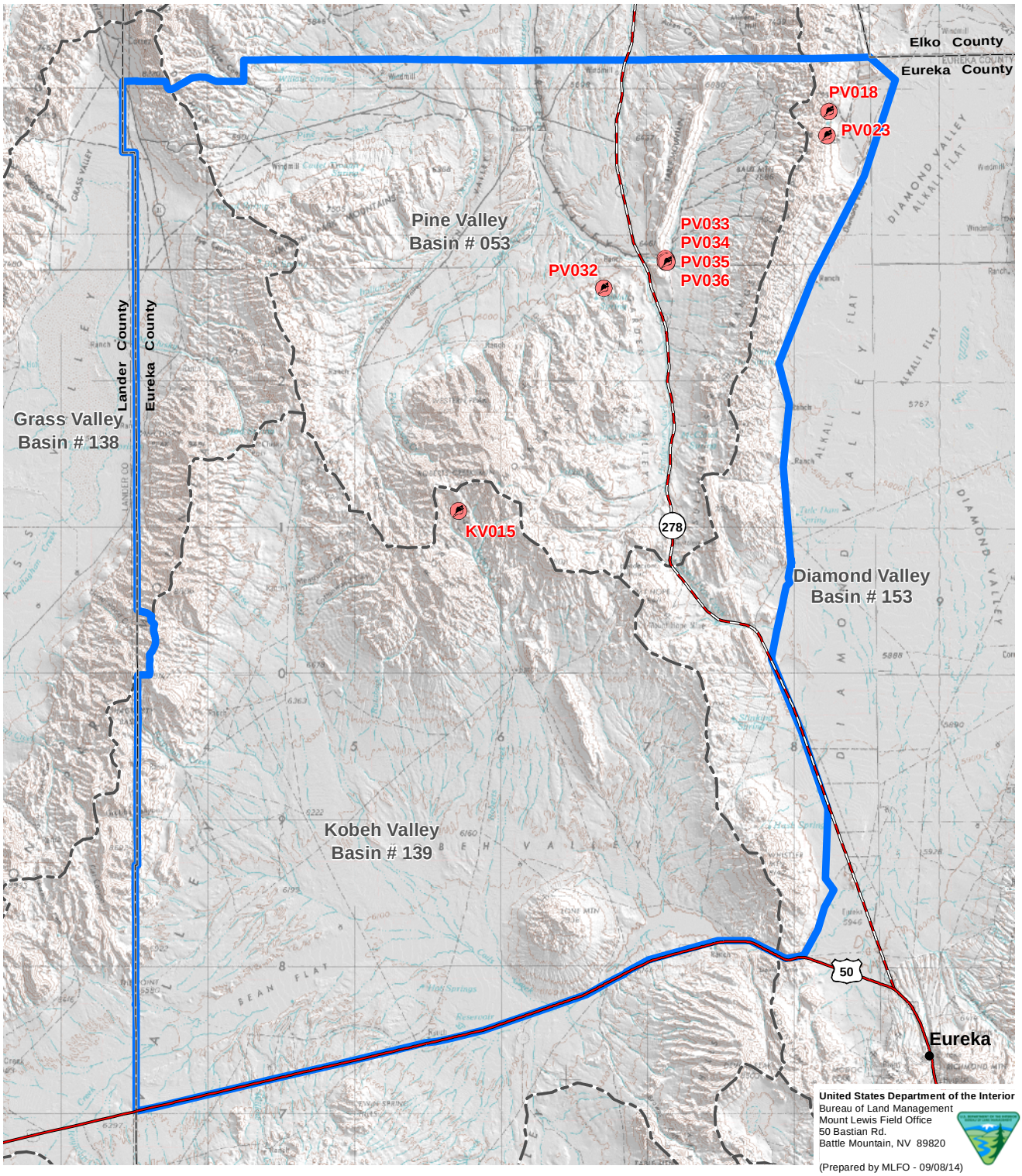
3.15.2.3 Aquatic Species

3.15.2.3.1 Invertebrates

Permanent and temporary waterbodies provide habitat for aquatic invertebrates. These aquatic organisms are indicators of water quality conditions and they serve important roles in the dynamics of the aquatic food web. Based on surveys in Birch Creek, the most abundant invertebrate groups included mayflies (Ephemeroptera), caddiflies (Trichoptera), stoneflies (Plecoptera), flies (Diptera), beetles (Coleoptera), and leeches (Hirudinea; USDOI BLM 2012b). These same groups, as well as snails (Gastropoda) and true bugs (Hemiptera), were common in Pete Hanson Creek. Invertebrate groups collected in Willow Creek included mayflies, stoneflies, and beetles (Starr 2011). Invertebrates were considered to be abundant at all sites sampled in Willow Creek.

Five major invertebrate groups typically are present in all types of springs including nematodes, aquatic worms (Oligochaeta), water mites (Acari), caddisflies, and chironomid midges. Several groups such as flatworms and stoneflies are present only in springs with permanent water sources.

A regional springsnail survey was conducted in selected springs within Antelope, Diamond, Huntington, Kobeh, Little Smokey, and Pine Valleys in 2007 by SRK (2010). Approximately 40 of the surveyed springs are within the 3 Bars Project area. Six of these springs contained snails, although species were not identified (**Figure 3-37**). Snails also were observed at two sites within unnamed streams in Pine Valley. Some of these snails could be springsnails. This group of mollusks is considered important because of their restricted distribution and native origin. The BLM considers springsnails to be a sensitive group and manages public lands to protect these species and their habitats.



Legend

- Snail Observation
- Hydrographic Basin
- 3 Bars Project Area

Source: SRK 2010.

3 Bars Ecosystem and Landscape Restoration Project

Figure 3-37

Snail Observations

0 1 2 3 4 5 10 Miles

0 1 2 3 4 5 10 Kilometers

N

3.15.2.3.2 Lahontan Cutthroat Trout

Fish surveys in the project study area have focused on the occurrence of Lahontan cutthroat trout. The Lahontan cutthroat trout is an inland subspecies of cutthroat trout (family Salmonidae). The species may be either riverine or lacustrine and is endemic to the Lahontan Basin of northeast California, southeast Oregon, and northern Nevada.

The range for Lahontan cutthroat trout in Nevada includes the Truckee, Carson, Walker, Quinn, and Humboldt River Basins, the Honey and Coyote Lake Basins, and Black Rock Desert Basin. Riverine, or stream-dwelling, Lahontan cutthroat trout usually live less than 5 years and may reach 10 to 15 inches in length. Females mature at 3 to 4 years of age and males at 2 to 3 years of age (Coffin and Cowan 1995). As with all cutthroat trout, the Lahontan cutthroat trout is an obligate riverine spawner. Spawning occurs from April to July, depending on stream discharge, elevation, and water temperature. Most remaining populations of Lahontan cutthroat trout in Nevada occupy higher elevation, low-order streams (Dunham et al. 1999). Spawning and nursery habitat is characterized by cool-water pools in close proximity to instream cover, velocity breaks, well-vegetated and stable streambanks, and relatively silt-free rocky substrate in riffle-run areas (Coffin and Cowan 1995). This species spawns in riffles over gravel substrate when water temperatures are between 41 to 60 ˚F. Intermittent tributaries are sometimes used as spawning sites during high-water years. Fry may develop in the tributary stream until flushed into the mainstream during high runoff (Coffin 1981 *cited in* USDOI BLM 2012b, Trotter 1987).

General characteristics of riverine cutthroat trout habitat include a relatively stable flow regime, a 1:1 pool to riffle ratio, well-vegetated stable streambanks, instream cover exceeding 25 percent, and relatively silt-free riffle-run areas. Cutthroat trout waters generally have a stable summer temperature regime with less than 39 ˚F fluctuation in water temperature and maximum water temperatures less than 72 ˚F (Hickman and Raleigh 1982). Lahontan cutthroat trout may have a higher thermal tolerance than other cutthroat trout and can tolerate temperatures exceeding 80 ˚F for short periods of time and 57 to 63 ˚F fluctuations of temperature (Ausich 1983, and Dickerson and Vinyard 1999 *cited in* USDOI BLM 2012b). Beaver ponds may provide thermal refuge for trout in the summer and winter. Habitat requirements may vary somewhat with life stage and season (Coffin and Cowan 1995). Lahontan cutthroat trout primarily feed on terrestrial and aquatic invertebrates, although larger fish may be fish-eating.

The decline of the Lahontan cutthroat trout has been primarily attributed to the loss and degradation of habitat. Agricultural and municipal uses of water from streams or lakes have reduced or altered the stream discharge in this species' range. Grazing has altered the physical characteristics of stream channels and increased the sediment loads in many Lahontan cutthroat trout streams. Mining, urban development, logging, road construction, and dam building have also been associated with changes in stream channel morphology and water quality (Coffin and Cowan 1995, NDOW 2004).

The Lahontan cutthroat trout competes with non-native trout species that were historically stocked for recreational fishing opportunities. Dunham and Vinyard (1996 *cited in* USDOI BLM 2012b) found that the distribution of Lahontan cutthroat trout can be truncated when brook trout are present, although they noted that the results were variable. Furthermore, Lahontan cutthroat trout have hybridized with non-native rainbow trout in many areas (Coffin and Cowan 1995, NDOW 2004).

Lahontan cutthroat trout conservation efforts are ongoing and involve fish transplants, population and habitat surveys, genetic evaluations, habitat improvement projects, grazing management, use of riparian fencing, and creation of fishery management plans for several basins. The objective of these management efforts is the protection or

restoration of habitats that sustain viable self-sustaining populations of this species. A self-sustaining population is defined as having been established 5 or more years and having three or more age classes (Coffin and Cowan 1995).

Lahontan cutthroat trout populations occur in three streams within the project study area—Birch, Pete Hanson, and Willow Creeks. The headwater areas of Birch and Pete Hanson Creeks originate at elevations of approximately 8,200 and 7,200 feet amsl, respectively. Genetic analyses have determined that pure strains (i.e., fish with unmixed lineage over many generations) exist in Pete Hanson Creek. Recent genetic analysis on the Birch Creek Lahontan cutthroat trout has shown a small degree of hybridization with rainbow trout. Of the 30 fish sampled, 8 had rainbow trout alleles at one locus that were the result of an historic hybridization event. Results for the genetic analysis on the Willow Creek population are pending. Pete Hanson Creek was stocked with Lahontan cutthroat trout from Shoshone and Santa Fe Creeks (Elliott 2013a).

Surveys in 2009 indicated that Lahontan cutthroat trout occupy approximately 1.9 miles in Birch Creek and 3.5 miles in Pete Hanson Creek (**Figure 3-38**). Population estimates during the 2009 surveys were 116 fish/mile in Birch Creek and 445 fish/mile in Pete Hanson Creek (NDOW 2009a). Comparison of 2009 Lahontan cutthroat trout densities with previous survey results indicated that population levels in Birch Creek are stable, while the Pete Hanson population estimates are more variable (**Table 3-44**). Lahontan cutthroat trout were surveyed in Willow Creek in September 2011 (Starr 2011). The estimated density for this species was 106 fish/mile in the lower portion of the creek. The fish collected in Willow Creek were considered healthy and representative of at least three different Lahontan cutthroat trout age classes. Lahontan cutthroat trout occupies approximately 0.5 mile in the middle portion of Willow Creek. In addition to occupied habitat in these perennial and intermittent streams, potential habitat has been identified by the NDOW surveys (**Figure 3-38**). Potential recovery streams for Lahontan cutthroat trout within the project area include Henderson and Vinini Creeks (Coffin and Cowan 1995); these streams have 15.6 miles of potential habitat (7 and 8.6 miles respectively).

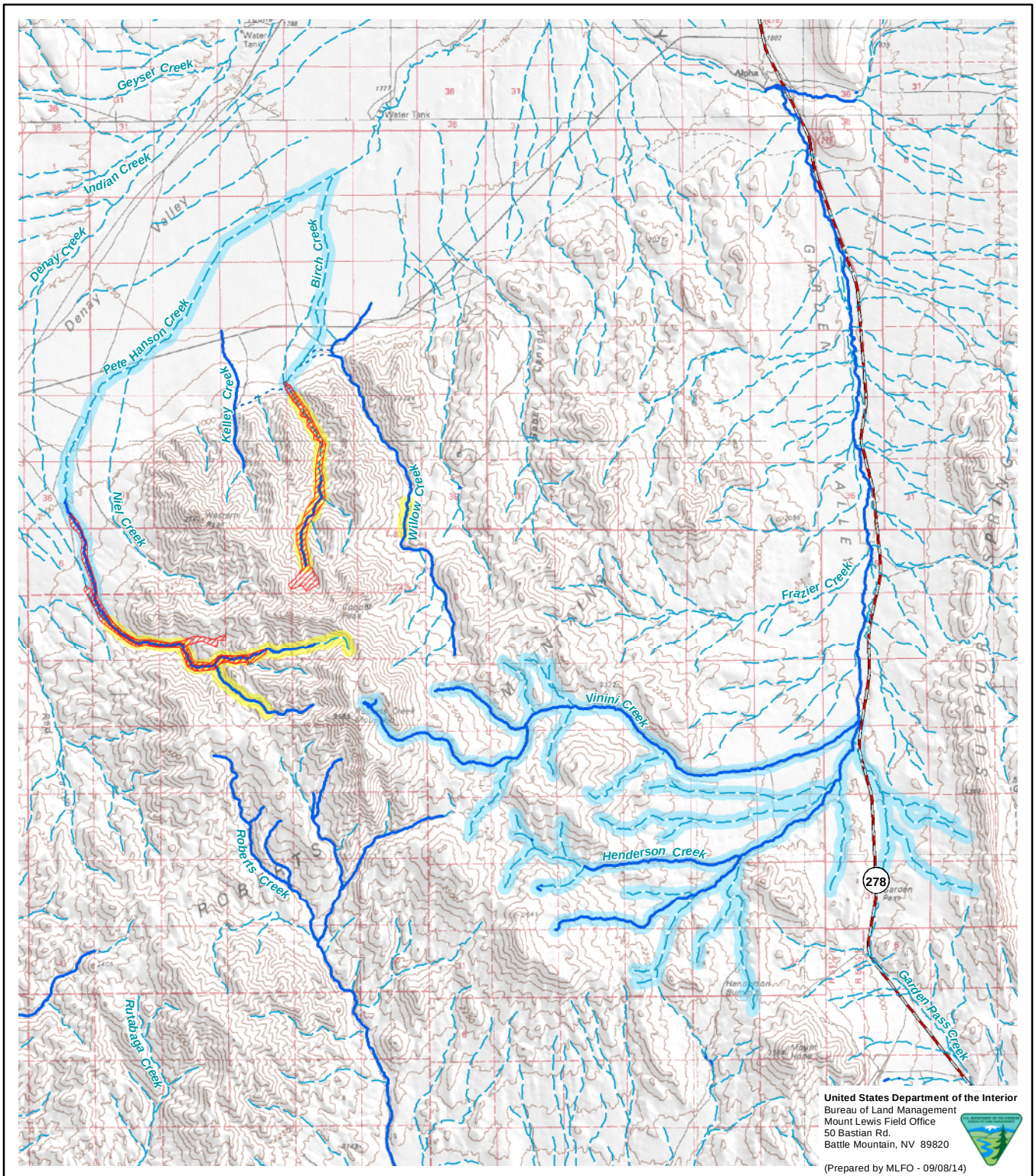
TABLE 3-44

Summary of Lahontan Cutthroat Trout Surveys in Birch, Pete Hanson, and Willow Creeks

Stream	Survey Years			
	1998	**2003**	**2009**	**2011**
Birch Creek				
Miles Occupied	1.5	1.5	1.9	NS
LCT/Stream Mile	153	198	116	NS
Pete Hanson Creek				
Miles Occupied	3.5	3.5	3.5	NS
LCT/Stream Mile	382	823	445	NS
Willow Creek				
Miles Occupied	NS	NS	NS	0.5
LCT/Stream Mile	NS	NS	NS	106

NS = Not surveyed.
LCT = Lahontan cutthroat trout.
Source: NDOW (2009a), Starr (2011).

Management direction for Lahontan cutthroat trout is provided in the *Lahontan Cutthroat Trout Species Management Plan for the Upper Humboldt River Drainage Basin* (Elliott 2004), and the *Lahontan Cutthroat Trout Recovery Plan* (Coffin and Cowan 1995). A portion of the project area falls within the Humboldt River basin, which supports the greatest number of riverine populations. Management objectives for this species focus on the protection and



United States Department of the Interior
Bureau of Land Management
Mount Lewis Field Office
50 Bastian Rd.
Battle Mountain, NV 89820

(Prepared by MLFO - 09/08/14)

Legend

- LCT Populated Creek
- LCT Potential Habitat
- Less than Optimal Conditions for LCT
- Perennial Stream Reach
- Intermittent Stream Reach
- Canal/Ditch
- 3 Bars Project Area

Source: BLM 2009f, 2012j; JBR 2009; NDOW 2012b; USGS 2012b.

3 Bars Ecosystem and Landscape Restoration Project

Figure 3-38

Lahontan Cutthroat Trout (LCT) Habitat

0 1 2 3 Miles
0 1 2 3 4 Kilometers

N

restoration of habitats that sustain viable self-sustaining populations. Threats to Lahontan cutthroat trout include habitat fragmentation due to physical and biological conditions, alteration of stream discharge, water quality degradation, and introduction of non-native fish species (Coffin and Cowan 2005, USDOI USFWS 2010).

3.15.2.3.3 Other Fish

Other fish species are also likely to occur in study area streams, based on historic occurrences. Speckled dace, redside shiner, Tahoe sucker, mountain sucker, and Lahontan tui chub have been reported in the Pine Creek Drainage (Elliott 2013b). Speckled dace also are known to occur in Coils Creek. Two additional streams, Roberts and McClusky Creeks, contain sport fish species including brook, brown, and rainbow trout (Petersen 2012). McClusky Creek has been stocked with brook trout, and Roberts Creek with rainbow trout (Elliott 2013b).

3.15.3 Environmental Consequences

3.15.3.1 Key Issues of Concern Considered during Evaluation of the Environmental Consequences

Based on the AECC and public scoping comments, the following issues were identified for aquatic biological resources:

- Habitat conditions for Lahontan cutthroat trout are less than optimal.
- Limiting factors for Lahontan cutthroat trout include insufficient residual pool depth and cemented substrate.
- There has been a decline in fisheries habitat complexity.
- Address the need for habitat improvements in occupied Lahontan cutthroat trout streams (Birch, Pete Hanson, and Willow Creeks), Lahontan cutthroat trout recovery streams (Vinini and Henderson Creeks), and sport fish streams (Roberts and McClusky).
- Increase public awareness of Lahontan cutthroat trout in Willow Creek.
- Consider historical and current population trends for Lahontan cutthroat trout in the 3 Bars Project area to determine recovery status.
- Identify known and potential conflicts with Lahontan cutthroat trout and livestock and wild horses and mitigation measures that could be implemented to minimize effects from these conflicts.
- Concern regarding historical trout numbers in some drainages within the 3 Bars project study area.
- Concern regarding fish barriers consisting of culverts and a headcut on Lower Roberts Creek.
- Evaluate and consider the effect of wildland fire on special status species.

3.15.3.2 Significance Criteria

Impacts to aquatic biological resources would be considered significant if the BLM actions resulted in the following:

- Action results in long-term (greater than 3 years in duration) alteration or loss of habitat in streams or springs containing Lahontan cutthroat trout (current populations or recovery sites), or other aquatic species.

- Action causes long-term (greater than 3 years in duration) loss of riparian vegetation from prescribed fire treatment or surface disturbance activities in streams or springs containing Lahontan cutthroat trout (current populations or recovery sites), or other aquatic species.
- Action results in water quality effects and potential toxicity conditions involving spills or chemical use that last more than 1 month in streams or springs containing Lahontan cutthroat trout (current populations or recovery sites), or other aquatic species.
- Action causes a flow reduction lasting more than 1 month in streams containing Lahontan cutthroat trout (current populations or recovery sites), or other aquatic species.
- Action causes permanent barriers to fish movement in streams containing Lahontan cutthroat trout (current populations or recovery sites), or other aquatic species.

The following assumptions were used in the impact analysis for aquatic biological resources:

- Surface disturbance activities within approximately 0.25 mile and upgradient of perennial streams could result in sediment or contaminant input to the streams.
- Flow reductions of greater than 5 percent of baseline conditions on a continual basis could result in an adverse effect on aquatic habitat for Lahontan cutthroat or other trout, or native fish species.

3.15.3.3 Direct and Indirect Effects

3.15.3.3.1 Direct and Indirect Effects Common to All Action Alternatives

Habitat Alteration

Proposed treatments would disturb aquatic habitat if equipment or vehicles enter streams or other waterbodies. The magnitude of the effect would vary depending on the area of disturbance and the duration of the activity. Instream disturbance would alter bottom substrates and possibly change the types of fish cover such as cobble, vegetation, or woody debris in the affected area, and the substrate alteration could adversely affect fish spawning habitat. Habitat alteration could affect Lahontan cutthroat trout, since restoration treatments are proposed for streams occupied by this species including Birch, Pete Hanson, and Willow Creeks. Final aspects of restoration treatment in Lahontan cutthroat trout occupied streams would be determined through BLM consultation with the USFWS and with input from NDOW. These treatments would be designed in a manner that would minimize direct effects to Lahontan cutthroat trout. The USFWS, and to some extent NDOW, would determine what level of impact would be acceptable.

The outcome of the restoration would ultimately benefit Lahontan cutthroat trout populations by expanding suitable habitat as a result of increased stream connectivity. Stream enhancements could involve the creation or expansion of pool habitat, improvements in the riffle to pool ratio, and the addition of instream cover for fish. Stream enhancements would also benefit other fish and macroinvertebrate species that inhabit the treated streams.

Small, temporary exclosure fencing and revegetation treatments would result in benefits to aquatic species. Small, temporary exclosure fencing would restrict access to treated areas by livestock, wild horses, and other wild ungulates. This action would exclude livestock, wild horses, and other wild ungulates from riparian treatment areas, resulting in reduced bank erosion and improved riparian vegetation cover. After treatment activities are completed, treated sites may be replanted. The addition of vegetation and riparian cover would be beneficial to water quality by reducing

erosion in the drainage. In addition, the BLM would place logs and other woody debris from felled pinyon-juniper into streams to slow water flow and create fish habitat.

Vegetation Modification

Treatment activities would affect riparian vegetation through disturbance by vehicles or equipment. Removal of noxious weeds and other invasive non-native plant species would cause a short-term loss of riparian vegetation, which could adversely affect aquatic habitat and ecological requirements for aquatic species, and cause a temporary increase in bank erosion.

Proposed treatments would have beneficial effects on riparian vegetation depending on the activity. Riparian vegetation is an important habitat component for aquatic species, as plants provide overhanging cover, temperature control via shading, bank stability, a food source from insects on the vegetation, and nutrient input to the stream from loss of leaves and branches. Beneficial effects would result from riparian restoration actions that would improve riparian community health and resiliency. These include stream channel restoration and removal of pinyon-juniper from the riparian zone. Replacing invasive plant species with native vegetation can improve food availability to insectivorous fish species, as native plants typically support a more diverse native insect community. The removal of noxious weeds and other invasive non-native vegetation and restoration of the streamside vegetation to include native plant species would be beneficial to the stream morphology and the ecological requirements for aquatic species long-term (USDOI BLM 2007b:4-76).

Water Quality

Proposed treatments would result in short-term adverse effects on water quality. Surface disturbing activities within or near streams and springs could cause short-term increased sediment input. The extent of the area affected by sediment would depend on soil composition and the characteristics of the receiving stream or standing waterbody (e.g., flow conditions, channel or waterbody morphology, presence of aquatic vegetation, and gradient). Streams with firm substrates consisting of sand, gravel, or cobble would exhibit lower levels of sedimentation compared to soft substrates such as silt. Typically, the extent of downstream movement of sediment is less during low flow conditions and more extensive during high flow conditions. However, the suspended sediment levels would be more diluted under high flow conditions due to the higher water volumes.

Increases in sediment entering a stream could adversely affect fish health and stream quality. Suspended sediment can affect physiological functions such as oxygen uptake for aquatic species. Depending on the sediment level and sensitivity of the species, effects can range from reduced health to mortality (Waters 1995). Increased sediment levels can bury invertebrates and early life stages of fish. Sedimentation can affect fish habitat by covering spawning and rearing areas, thereby reducing the survival of fish embryos and juvenile fish. Excessive sedimentation also can fill in pool habitats. Pool habitats provide important fish cover due to depth and overwintering habitat.

Vehicles and equipment used within or adjacent to streams and waterbodies could also pose a risk to aquatic biota from fuel spills or lubricant leaks. If fuel reached a waterbody, aquatic species could be exposed to toxic conditions. Impacts could include direct mortality or reduced health of aquatic organisms. The magnitude of a potential spill would depend on the flow conditions, channel or waterbody morphology, and gradient, and the response time and effectiveness of containment and cleanup operations. To reduce these risks, refueling activities would not be allowed within 300 feet of a stream.

Long-term, treatments that restore channel morphology and stream function, remove noxious weeds and other invasive non-native vegetation, improve the health and resiliency of riparian vegetation, and reduce the risk of catastrophic wildfire would benefit water quality and aquatic organisms.

Water Use

Stream water could be used during restoration projects and for prescribed fire control and could result in temporary reductions in stream flows or water levels in ponds. The BLM occasionally withdraws water from streams or ponds during wildfire events as an emergency measure for fire suppression. The BLM works closely with resource advisors to make sure this option is authorized and does not impact other key resources including aquatic species. Water withdrawal would consider the presence of Lahontan cutthroat trout and game fish species and their habitats when selecting water sources. Flow regime is considered the primary determinant regarding the structure and function of aquatic and riparian ecosystems for streams and rivers (Poff et al. 2010). Based on a literature review by Poff and Zimmerman (2010), fish was the only aquatic biological group to consistently respond negatively to reductions in flow magnitude. Flow or water level reductions could adversely affect fish by decreasing the amount of aquatic habitat and affect critical life events such as spawning, early life development, growth, physiological functions, and competition (Bradford and Heinonen 2008, Poff and Zimmerman 2010).

The response of macroinvertebrate communities to reduced flow has been the subject of recent literature reviews by Dewson et al. (2007) and Poff and Zimmerman (2010). Based on a review of studies involving relatively large flow reductions (approximately 60 to 100 percent compared to base flow conditions), results showed that macroinvertebrate abundance and diversity declined in most cases due to reduced habitat diversity, loss of food sources, and changes in competition and predation. Increased water temperature and sedimentation and altered attached algae assemblages also can contribute to changes in aquatic community composition and taxonomic richness.

3.15.3.3.2 Direct and Indirect Effects under Alternative A (Preferred Alternative)

Riparian Treatments

Riparian area treatments would focus on restoring stream and habitat functionality in areas where both the morphology and structural integrity of the stream channel, and the plant species composition within the riparian zone, have been compromised by past actions. Examples of compromised stream channel integrity include: 1) areas where the channel is eroded and incised; 2) areas where there is a sharp break in the slope of the channel due to erosion (knickpoint or headcut); and 3) areas where the channel has been diverted from its historic watercourse due to road construction or other factors. Because of loss of structural integrity in compromised channels, stream velocities have increased over historic levels, nutrient-rich sediment is not being delivered to riparian vegetation, and there is less groundwater recharge within the floodplains, to the detriment of fish and other aquatic organisms.

Treatments would primarily occur in upper and lower Henderson Creek (8.9 miles of perennial stream), Roberts Creek (7.6 miles), upper and lower Vinini Creek (5.9 miles), and Willow Creek (4.3 miles). Willow Creek supports Lahontan cutthroat trout along 0.5 mile of occupied perennial stream habitat, while Henderson and Vinini and unnamed creeks have known or potential Lahontan cutthroat trout habitat, including approximately 9.3 miles of potential perennial habitat and 3.6 miles of potential intermittent habitat. None of the springs are known to contain snails or springsnails.

Adverse Effects

Riparian vegetation removal could adversely affect ecological functions of riparian vegetation on a short-term basis, although the affected area would represent a relatively minor portion of the overall riparian zone. Streamside vegetation removal could decrease the amount of woody debris deposited in the stream, although the BLM proposes to place down logs and other wood from felled pinyon-juniper into streams to improve stream habitat.

The adverse effects of mechanical treatments on water quality would be expected to be localized and of short-term in duration, with water quality returning to pre-disturbance conditions within several days or weeks after treatment is completed. Adverse effects for all proposed riparian zone projects could result from soil disturbance and erosion, and the spill of fuel or lubricants into water bodies. Habitat alteration or loss at a particular site would be considered relatively minor in relation to the overall habitat in the stream, especially since treatments would be focused on degraded stream habitat. Instream disturbance would occur in Lahontan cutthroat trout occupied (Willow Creek) or recovery (Henderson and Vinini Creeks) streams, and game fish streams (Roberts and McClusky Creeks), as part of habitat enhancement. The BLM would consult with the USFWS and NDOW regarding designing treatments in a manner that would minimize direct effects to Lahontan cutthroat trout. This approach would avoid significant impacts to Lahontan cutthroat trout.

The adverse effects of mechanical treatments on water quality would be expected to be short-term in duration, with water quality returning to pre-disturbance conditions within several days or weeks after treatment is completed. Adverse effects for all proposed riparian zone projects could result from soil disturbance and erosion, and the spill of fuel or lubricants into water bodies. Habitat alteration or loss at a particular site would be considered relatively minor in relation to the overall habitat in the stream. Riparian treatments would be localized and targeted for areas that are generally degraded in terms of riparian vegetation quality or characterized by the absence or limited number of riparian species. The BLM would consult with the USFWS and NDOW regarding designing treatments in a manner that would minimize direct effects to Lahontan cutthroat trout. This approach would avoid significant impacts to Lahontan cutthroat trout. Treatment methods used in Birch and Willow Creeks within the Roberts Mountains WSA would have to meet non-impairment criteria for WSAs, but would not include the use of vehicles or building of new roads.

Beneficial Effects

The BLM's highest priority is to use vegetation treatments to restore high priority subbasins within key watersheds to benefit fish and other aquatic organisms. Over the short-term, adverse effects to aquatic organisms from vegetation treatment activities proposed by the BLM could occur, but treatments would lead to improved conditions for aquatic species over the long-term. The eventual growth of desirable vegetation in treated areas would moderate water temperatures, buffer the input of sediments from runoff, promote bank stability, and contribute woody debris to aquatic bodies. Ongoing efforts by the BLM to enhance riparian vegetation would also help to increase the number of miles of BLM-administered streams that are classified as Proper Functioning Condition.

Removing invasive vegetation such as pinyon-juniper could increase streamflow, while replacing noxious weeds and other invasive non-native species with native vegetation would stabilize streambanks and moderate streamflows. Furthermore, replacing noxious weeds and other invasive non-native vegetation with shrubs and trees would also increase the amount of woody debris in water bodies that can be used as habitat by fish (USDOI BLM 2007c:4-69).

The beneficial effects of riparian treatments would include aquatic habitat enhancements. Various treatment methods would be used to improve issues involving headcuts and stream incisions. The treatment activities would include streambank bioengineering, grade stabilization, and vegetation plantings to initiate stream restoration. These treatment activities would enhance pool and riffle habitat by increasing depths and providing additional in-stream structure by adding cobble and boulder substrates and woody debris. After restoration is completed, aquatic habitat would occur on a more consistent basis as a result of increased stability of the channel banks and substrates. The habitat improvements also would be beneficial to macroinvertebrates by stabilizing bottom substrates and creating a diverse composition of substrate types. Macroinvertebrates represent an important food source for fish species. As a result of the stream restoration activities, habitat for Lahontan cutthroat trout (in both occupied and recovery streams) and game fish species would be improved in terms of functionality and structure. Habitat improvements in the Lahontan cutthroat trout recovery streams may assist in the reintroduction of this species into habitats that were used historically, which would meet the goals and objectives of the *Lahontan Cutthroat Trout Recovery Plan* (Coffin and Cowan 1995). In addition, wet meadows and stream reaches could be created under this treatment, which would provide additional aquatic habitat for fish and invertebrates.

Vegetation treatments to thin or remove pinyon-juniper from within floodplains and near streams would help to create fire breaks and would benefit aquatic animals by reducing the risk that a large, uncontrolled wildfire would destroy a large amount of high quality aquatic habitat. Fire can adversely affect aquatic organisms by degrading water quality and raising water temperature (USDOI BLM 2007c:4-70).

After restoration, treatment areas may be excluded using small, temporary exclosure fencing to ensure that restored sites and plantings are not damaged by livestock, wild horse, and other wild ungulates. Also, fencing would be used to protect riparian habitat at Denay Pond, Lone Spring, and Treasure Well.

Aspen Treatments

Adverse Effects

Potential adverse impacts to fish and other aquatic resources from the three aspen treatments associated with stream habitat would be similar to those for riparian treatments. However, only about 15 acres of aspen would be treated annually under the proposed action, and only 4 miles of stream are associated with aspen treatments. Aspen treatments would occur in areas that are occupied, or could be occupied, by Lahontan cutthroat trout. Treatments could result in erosion that could adversely impact nearby stream habitat and aquatic resources, including game and non-game fish.

Beneficial Effects

Restoration of aspen stands could benefit fish and other aquatic species, primarily through an improvement in water quality. Pinyon-juniper would be removed to reduce competition between aspens and pinyon-junipers for space and nutrients, and may occur near roads to improve their effectiveness as fuel breaks. Fuel breaks would help to slow the spread of wildfire, reducing the chances that a large, uncontrolled wildfire would destroy a large amount of high quality aquatic habitat. Downed trees and other large woody material from felled trees could be placed in streams as a source of woody debris for fish. The additional woody debris would provide improvements in the quantity and quality of fish cover and an additional source of organic material to the stream. The BLM would remove or burn slash and downed wood if there is the potential for the material to increase the risk of wildfire.

If small, temporary exclosure fencing is installed near streams, it would benefit aquatic habitat and species by restricting livestock, wild horses, and other wild ungulates from entering the stream. This would reduce the amount of direct alteration of aquatic habitat and minimize erosion. Fencing would also help to ensure that aspen restoration treatments are successful.

Pinyon-juniper Treatments

Adverse Effects

Approximately 5 miles of stream are associated with riparian management projects that occur within the larger pinyon-juniper management area. Seven miles of perennial stream treatments are associated exclusively with pinyon-juniper management projects, including the Birch Creek, Upper Pete Hanson, Tonkin South, Upper Roberts Creek, and Vinini treatment units. These pinyon-juniper project areas also overlap with Lahontan cutthroat trout and other fish habitat—Atlas (Roberts Creek), Birch Creek (Birch Creek), Lower Pete Hanson (Pete Hanson Creek), Pete Hanson (Pete Hanson Creek), and Vinini Unit (Henderson Creek). Habitat alteration could occur near streams that provide known or potential Lahontan cutthroat trout habitat (Birch, Pete Hanson, and Henderson Creeks).

The types of impacts to these perennial and intermittent streams would be similar to those discussed earlier, including increased sediment loads into streams, spill of fuel or lubricants into streams, and flow reduction due to use of water for fire control. Approximately 30 percent of the treatment area for these units has moderate to high water erosion risk, and mechanical treatments could cause soil disturbance that could lead to erosion and sedimentation of streams. The effects of treatments on water quality would be short-term, with water quality returning to pre-disturbance conditions within several days or weeks after treatment is completed. However, this risk is negligible in areas where pinyon-juniper are felled using chainsaws, or pinyon-juniper are shredded, as the resultant woody debris would help to protect the soil. If large amounts of woody debris are left on the ground, however, it could provide fuel for a wildfire.

Fire treatment could result in increased turbidity in streams due to runoff from burn areas. Sediment input could adversely affect stream substrate composition due to increased silt deposition. The magnitude of sediment input would depend on gradient in the burned portion of the drainage area and the extent of vegetation growth between the burn area and the receiving streams. Densely vegetated areas could capture and reduce the sediment input to streams. Standard operating procedures would reduce the sediment input to downgradient streams, but would not eliminate all sediment input into drainages. Sediment input could adversely affect aquatic habitat and the health of fish and invertebrate species.

High severity fires tend to burn much of the organic material on a site, exposing mineral soil, and sometimes creating hydrophobic soil layers. This hydrophobic condition increases the rate of water runoff and erosion. Nearly all of the treatment acreage associated with treatment units near perennial streams has soils with a moderate to high risk of fire degradation. The BLM would reduce this risk by conducting low severity prescribed burns. It is unlikely that burning would be conducted along streams with Lahontan cutthroat trout due to the potential for adverse impacts to stream water quality and loss of vegetative cover adjacent to streams. The BLM would consult with the USFWS before conducting treatments near streams occupied by Lahontan cutthroat trout.

Water may be needed for fire control. If water sources include perennial streams or springs connected to surface flow, temporary flow reductions could occur in streams. The magnitude of the effect would depend on the water volume and timing of the withdrawal.

Beneficial Effects

The removal of pinyon-juniper vegetation in riparian zones could increase stream flows and improve aquatic habitat as a result of reduced water uptake by vegetation. Manual, mechanical, and fire treatments in pinyon-juniper management areas would improve aquatic habitat by placing woody debris at strategic locations to expand the size of the streams and result in the creation or expansion of pool habitats. These treatments would benefit Lahontan cutthroat trout habitat in Birch, Pete Hanson, and Willow Creeks. Habitat improvements near Henderson Creek could assist in the recovery of Lahontan cutthroat trout. The stream structures (i.e., logs and pools) could also serve as fuel breaks to slow the spread of wildland fire and reduce fire effects on aquatic habitat and species.

Prescribed fire treatments could benefit aquatic species by reducing hazardous fuel loads, and therefore the risk of a destructive high-intensity wildfire. In many cases, pre-treatment fuels reductions (e.g., thinning and pile burning) would be necessary to reduce the severity of prescribed burns near or within riparian zones (USDOI BLM 2007b:4-70). Removal of pinyon-juniper and shredding of sagebrush to create fuel breaks would help to contain and limit the spread of wildfire, to the benefit of aquatic resources.

Sagebrush Treatments

Adverse Effects

Four streams (Birch, Henderson, Pete Hanson, and Vinini Creeks) provide potential Lahontan cutthroat trout, with 1.6 miles of potential perennial and 4.4 miles of intermittent habitat within sagebrush treatment areas. However, there is no occupied Lahontan cutthroat trout habitat in the sagebrush treatment areas. None of the springs are known to contain snails or springsnails.

Most of the sagebrush projects (Alpha, Kobeh East, Nichols, Roberts Mountain Pasture, South Simpson, Three Corners, and Whistler Sage) overlap with intermittent/ephemeral, but not perennial streams. Potential habitat and water quality effects in these streams would mainly affect invertebrate communities, but fish could also be present during spring runoff.

Approximately 5 miles of perennial stream are associated with riparian management projects within the larger sagebrush management area (Lower Henderson 1 and 3, and Lower Vinini Creek units). Only 1.3 miles of perennial stream habitat are associated exclusively with sagebrush management projects—Table Mountain (Henderson and Vinini Creeks), and West Simpson Park (unnamed) units. Lahontan cutthroat trout potential habitat occurs in Henderson and Vinini Creeks, while native fish (speckled dace) have been reported in Coils Creek. Manual and mechanical treatments could result in increased water runoff and erosion, and spills of fuels and lubricants, to the possible detriment of water quality and aquatic habitat.

Fire treatments on the West Simpson Park Unit to remove non-native vegetation could result in increased turbidity in streams due to runoff from burned areas. Adverse effects on stream habitat and aquatic species would vary depending on the precipitation conditions. Under average and dry year precipitation conditions, measured effects of prescribed fire would be relatively small or undetectable (Clifton et al. 2006). If large storm events occur within the first few years after prescribed fire, erosion could be substantial.

Livestock grazing could be used for short periods to remove undesirable vegetation before using other treatment methods. Grazing can contribute to the spread of noxious weeds and other invasive non-native vegetation through preferential grazing of native vegetation over noxious weeds and other invasive non-native vegetation, and by

movement of undesirable vegetation into uninfested areas in livestock feces (USDOI BLM 2009b). Livestock could also degrade vegetation and soils, and deposit fecal material in or near streams, which would adversely affect water quality and habitat for aquatic species. Livestock grazing also could directly alter aquatic habitat if animals have access to the stream channels.

Beneficial Effects

The beneficial effects of sagebrush treatments would include improvements in aquatic and riparian habitats and a reduction in wildfire risk. Grade stabilization structures, streambank bioengineering, removal/reconstruction of water development, and vegetation planting to initiate stream restoration would be used at the Henderson 1 and 2 units and Lower Vinini Unit that are within sagebrush treatment units and would benefit aquatic species and habitat. Trees that are removed as part of this treatment could be placed in streams to expand the stream width and help create or expand pool habitats. The woody structures also would provide additional in-stream cover for fish and organic material to the stream environment.

The BLM would use mowers and shredders to create fuel breaks. A decreased risk of wildfire would benefit aquatic habitat and species by reducing the occurrence of catastrophic wildfires and the associated adverse effects on habitat and species.

3.15.3.3.3 Direct and Indirect Effects under Alternative B (No Fire Use Alternative)

Under Alternative B, the number of acres of riparian treatments (4,000 acres) and miles of stream improved to restore channel morphology and function (31 miles) would be similar to Alternative A.

Because the BLM would have to rely more on mechanical treatments to reduce hazardous fuels and improve woodland health, improve the health of aspen stands, and control non-native vegetation, short-term soil disturbance and erosion would be similar to that under Alternative A, even though fewer acres would be treated. However, fire-related effects on water quality and aquatic habitat would not occur under Alternative B. Although this would be beneficial to fish in the short-term, in the long-term there would be a higher risk of wildfire as a result of buildup of hazardous fuel materials that could have been removed through the use of prescribed fire and wildland fire for resource benefit. Fire would also not be used to improve woodland health and for stand replacement treatments in Phase II and III pinyon-juniper stands. These stands would be highly susceptible to a wildfire. Adverse effects on aquatic habitat and species could result from wildfires near perennial streams and springs.

Under Alternative B, the BLM would be able to demonstrate that it is restoring landscapes and addressing multiple resource issues. The BLM would also make gains toward meeting Proper Functioning Condition objectives on several streams in the project area. Treatment benefits to fish and other aquatic organisms under Alternative B would be less than under Alternative A, but not substantially less, as fire would be used sparingly to improve habitat for fish under Alternative A. However, risks to fish from wildfire would be greater under this alternative than for Alternative A.

3.15.3.3.4 Direct and Indirect Effects under Alternative C (Minimal Land Disturbance Alternative)

Under this alternative, the BLM would only treat vegetation using manual and classical biological control methods. Overall, only about one-fourth as many total acres, acres of wetland, floodplain, and riparian habitat, and miles of stream restoration would be treated under Alternative C as compared to Alternative A. Short-term soil disturbance and erosion would occur in watersheds as a result of manual and classical biological treatments, but effects would be

substantially less under this alternative than under the other action alternatives because fewer acres would be treated, and because manual and biological treatments cause less soil disturbance compared to mechanical and fire treatments.

The BLM would have limited success in restoring channel morphology and function in degraded streams to benefit Lahontan cutthroat trout and other aquatic organisms. The BLM would be able to hand place rocks, logs, and other materials in streams to slow water flows, and may be able to make minor changes to the stream morphology using hand tools, but these improvements would be minor.

Pinyon-juniper would be removed using chainsaws. Phase I woodlands and a limited acreage of Phase II woodlands would be targeted for treatments. Most treatments would occur near streams and roads to promote their use as fire breaks, to the benefit of aquatic resources. However, the BLM would not be able to conduct fire treatments to reduce hazardous fuels, or use mechanical equipment to create fire and fuel breaks, and thus the risks of wildfire and its effects on fish and other aquatic resources would be greater under this alternative than under the other action alternatives.

Under Alternative C, the BLM would do little to slow the spread of noxious weeds and other invasive non-native vegetation, including cheatgrass, or protect fish and wildlife habitat from devastating wildfire effects. Thus, benefits to fish and other aquatic organisms under Alternative C would be less than under Alternatives A and B. Although the BLM would make some gains toward meeting Proper Functioning Condition objectives on several streams in the project area, these gains would be less than under Alternatives A and B.

3.15.3.3.5 Direct and Indirect Effects under Alternative D (No Action Alternative)

There would be no direct effects to fish or other aquatic resources from 3 Bars Project treatments as no treatments would be authorized under this alternative. The BLM would not create fire and fuel breaks; thin and remove pinyon-juniper to promote healthy, diverse stands; reconstruct stream channels and improve riparian habitat; thin and/or remove pinyon-juniper and sagebrush to encourage understory development; restore fire as an integral part of the ecosystem; or reduce the risk of a large-scale wildfire to the benefit of fish and other aquatic resources and their habitats. Alternative D poses the greatest threat to Lahontan cutthroat trout, through long-term habitat loss and degradation.

3.15.3.4 Cumulative Effects

The CESA for fish and other aquatic resources is approximately 1,841,698 acres and includes those watersheds at the Hydrologic Unit Code 10 level that are all or partially within the 3 Bars Project area (**Figure 3-1**). Approximately 92 percent of the area is administered by the BLM, 6 percent is privately owned, and 2 percent is administered by the Forest Service. Past and present actions that have influenced fish and other aquatic resources in the 3 Bars ecosystem are discussed in Section 3.3.2.3.3.

3.15.3.4.1 Cumulative Effects under Alternative A (Preferred Alternative)

As discussed in Section 3.3.2.3.3, historic livestock grazing use has contributed to soil erosion and water quality degradation, especially in riparian zones and near streams occupied, or potentially occupied, by Lahontan cutthroat trout and other fish. This degradation in habitat is a major reason why the BLM is conducting stream channel and habitat restoration along 31 miles of streams. The BLM also proposes to install small, temporary exclosure fencing to exclude livestock, wild horse, and other wild ungulate access to riparian zone and aspen treatment areas. These actions should help to improve water quality in affected streams.

The BLM would continue to use ground-based herbicide applications to remove noxious weeds and other invasive non-native vegetation, and aerial-based application methods to remove cheatgrass, and would restore burned areas under the Burned Area Emergency Stabilization and Rehabilitation program, under existing authorizations on about 1,000 acres annually. The BLM primarily uses 2,4-D, glyphosate, imazapyr,, metsulfuron methyl, and picloram on the 3 Bars Project area, and could use imazapic on the area in the future. These herbicides have negligible to low risks to fish and other aquatic resources, except under accidental spill situations, which would be unlikely (USDOI BLM 2007b:4-80).These treatments could have a short-term adverse effect on non-target vegetation. These treatments would have long-term beneficial effects by helping to reduce hazardous fuels, improve native vegetation, slow the spread of noxious weeds and other invasive non-native vegetation, and reduce surface runoff and erosion associated with burn sites to the benefit of fish and other aquatic resources.

Recreation activities, primarily off-road vehicle travel, could impact stream habitat. Approximately 496 miles of road are within 500 feet of streams within the CESA. Approximately 16 miles of road are within 500 feet of perennial streams including Birch, Denay, Henderson, Pete Hanson, Vinini, and Willow Creeks. Approximately 11 miles of known or potential Lahontan cutthroat trout habitat occurs near roads. In addition, 76 miles of off-highway vehicle routes are within 500 feet of streams. Of those, approximately 11 miles of off-highway vehicle routes are within 500 feet of the same perennial streams that are near roads. Two miles of streams within 500 feet of off-highway vehicle routes contain known or potential Lahontan cutthroat trout habitat. Unpaved roads and off-highway vehicle routes near streams could contribute runoff and sediment to streams. Fishermen may also harvest Lahontan cutthroat trout and other game fish.

As discussed in the Mount Hope Project EIS, there is concern that water withdrawals for future livestock and domestic uses, mine projects, and agricultural activities could reduce surface water flows in streams associated with the Diamond Mountains, Diamond Valley, Roberts Mountain, Kobeh Valley, and Pine Valley. Water drawdown could adversely impact habitat used by Lahontan cutthroat trout, and could also impact habitat for other aquatic organisms and potential habitat for Lahontan cutthroat trout on Henderson Creek (USDOI BLM 2012b:4-48 to 4-50). If deemed necessary by the BLM based on water monitoring, the Mount Hope Project proponent would augment water flows at several springs and at Henderson and Roberts Creeks (USDOI BLM 2012b:3-93 to 3-105).

Future mining activities within the CESA may create adverse impacts to surface water resources, mainly by altering drainage features, by dewatering springs or stream segments, and by water quality impacts from runoff from disturbed areas or escapes from processing facilities. Most of these potential impacts from mining activities would be avoided or reduced through state and federal mining regulations and related compliance programs.

Surface water features within the CESA generally resemble those within the project area, consisting mainly of streams, springs, ponds, and playas in various conditions. In some locations, notably along Henderson and Pine Creeks and near the town of Eureka, irrigation return flows may have poorer water quality than rangeland streams and springs. These areas are not used by Lahontan cutthroat trout, but could be used by other fish and aquatic resources.

Land development, mineral development, and oil, gas, and geothermal exploration and development could affect about 10,000 acres in the reasonably foreseeable future, including about 8,335 acres of disturbance associated with the Mount Hope Project, and acreage associated with potential land sales (although it is unlikely that all of this land would be developed), roads, and rights-of-way for power and telephone lines. These projects would disturb soil, and could lead to soil erosion and water quality impacts in streams used by game fish and other aquatic resources. Land development and development of natural resources would involve the use of equipment and drilling of wells that

could result in hydrocarbon and other spills of hazardous materials that could impact surface water and groundwater; a recent oil spill at the Blackburn oil well in Pine Valley impacted over 3 acres (USDOI BLM 2012b:4-47).

Hazardous fuels reduction, habitat improvement, and noxious weed and other invasive non-native vegetation control projects would occur on up to approximately 142,000 acres (about 127,000 for the 3 Bars Project and about 15,000 acres for other hazardous fuels projects in the CESA), or 8 percent of the CESA. As discussed under direct and indirect effects, these treatments would lead to short-term increases in soil erosion and surface water runoff, but long-term benefits to water quality and possibly water flows to the benefit of fish and other aquatic organisms. Fire treatments could cause the development of hydrophobic soils, increasing surface water runoff. Soils over much of the CESA are susceptible to fire degradation. The disturbance effects resulting from restoration activities are predicted to have less impact and be less severe than fire effects and erosion caused by wildfire. Based on historic numbers, approximately 140,000 acres could burn during the next 20 years within the CESA.

3 Bars Project treatments would have short-term adverse effects on about 4,000 acres of riparian habitat, 9 miles of occupied Lahontan cutthroat trout streams, and 68 miles of potential Lahontan cutthroat trout streams. In addition, treatments under Alternative A could affect aquatic organisms found in about 1,000 miles of perennial and intermittent/ephemeral streams on the 3 Bars Project area. Adverse effects from treatments would generally be short-term, while benefits would be long-term and would accumulate with fish and other aquatic resources habitat effects that occur on other portions of the CESA. Because stream restoration and enhancement treatments on the 3 Bars Project area under Alternative A would affect less than 0.2 percent of the acreage on the CESA, these effects would be negligible. About 17 percent of the 3 Bars Project Area and 8 percent of the CESA would be treated to reduce hazardous fuels, and slow the trend toward large-sized fires of moderate to high severity in sagebrush and large stand-replacing fires in pinyon-juniper. A reduction in wildfire risk on the CESA would benefit aquatic organisms, and would be greatest under Alternative A.

3.15.3.4.2 Cumulative Effects under Alternative B (No Fire Use Alternative)

Under Alternative B, effects from non-3 Bars Project reasonably foreseeable future actions on fish and other aquatic resources would be similar to those described under Alternative A. Acres and types of wetland and riparian habitat treated under this alternative would be similar to Alternative B. However, less effort would be spent by the BLM on treatments to reduce wildfire risk and its associated impacts to aquatic habitat from soil erosion, including use of fire to restore natural fire regimes.

Adverse effects to fish and other aquatic resources would generally be the same as described for Alternative A. However, by not using fire, there would be no risks to fish and other aquatic resources or their habitats from fire on up to several thousand acres annually within the 3 Bars Project area. However, the use of fire could occur on several hundred acres annually on other portions of the CESA.

Because of the large number of acres treated, water quantity and quality should improve within the 3 Bars Project area and provide a benefit to fish and other aquatic resources within the CESA, although not to the extent as would occur under Alternative A.

Under Alternative B, restoration projects would occur along about 31 miles of streams, including about 9 miles of streams occupied by Lahontan cutthroat trout, and on about 2,000 acres of wetland and riparian habitat. Hazardous fuels reduction and habitat improvement projects could occur on about 63,000 acres within the 3 Bars Project area, and on an additional 15,000 acres within the CESA, or about 4 percent of the acreage within the CESA. The trend

toward large-sized wildfires of moderate to high severity in sagebrush and large stand-replacing fires in pinyon-juniper should slow, but treatments to reduce this risk on the CESA would be less under Alternative B than under Alternative A.

3.15.3.4.3 Cumulative Effects under Alternative C (Minimal Land Disturbance Alternative)

Under Alternative C, effects from non-3 Bars Project reasonably foreseeable future actions on fish and other aquatic resources would be similar to those described under Alternative A. Adverse, short-term effects to fish and other aquatic resources associated with the use of fire and mechanized equipment would not occur under Alternative C. However, fire use and mechanized equipment would be used on other portions of the CESA to improve habitat, remove hazardous fuels, and reduce the risk of wildfire. Treatments in the CESA would affect about 47,000 acres, or about 2 percent of the CESA; less than 0.2 percent of acreage on the CESA would be affected annually. 3 Bars Project restoration treatments would have short-term adverse and long-term beneficial effects on fish and other aquatic resources, but these effects would be negligible in the context of the acreage within the CESA and other types of activities that have effects on water resources, such as the Mount Hope Project. By not being able to use mechanical methods and fire to reduce hazardous fuels, treat vegetation to make it more fire resilient, create fire and fuel breaks, and remove downed wood and slash, however, the risk of wildfire and its impacts on water resources would likely increase on the 3 Bars Project area, to the potential detriment of fish and other resources that depend upon water in the CESA.

3.15.3.4.4 Cumulative Effects under Alternative D (No Action Alternative)

Under Alternative D, effects from non-3 Bars Project reasonably foreseeable future actions on fish and other aquatic resources would be similar to those described under Alternative A. There would be no cumulative effects on fish and other aquatic organisms from 3 Bars Project treatments as no treatments would be authorized under this alternative. The BLM could create fire and fuel breaks; thin and remove pinyon-juniper to promote healthy, diverse stands; slow the spread of noxious weeds and other invasive non-native vegetation using ground-based and aerial application methods of herbicides, especially cheatgrass; restore fire as an integral part of the ecosystem; and reduce the risk of a large-scale wildfire under current and reasonably foreseeable future authorized actions, but on a very limited acreage.

Based on historic treatments in the 3 Bars Project area, only about 1,500 acres would be treated annually in the CESA to reduce hazardous fuel levels and improve ecosystem health. Hazardous fuel levels would likely increase, and only a limited number of miles of fuel and fire breaks would be constructed under this alternative compared to the action alternatives. The BLM would conduct stream bioengineering and riparian habitat enhancements on a limited acreage and these projects would have to be authorized through separate decisions. Stream channels and riparian habitat would likely remain degraded and contribute to water quality concerns. Thus, riparian habitat used by Lahontan cutthroat trout and other aquatic organisms would remain degraded and contribute to water quality concerns. The trend toward large-sized fires of moderate to high severity in sagebrush, and large stand-replacing fires in pinyon-juniper, would likely increase. Of note, large regional wildfires have contributed to runoff, erosion, and water quality issues within the CESA, particularly outside treatment areas in the eastern mountainous parts of Grass Valley and Pine Valley. It is likely that wildfire incidence and severity would remain high under Alternative D. These effects would be detrimental to fish and other aquatic organisms.

3.15.3.5 Unavoidable Adverse Effects

Unavoidable adverse effects on aquatic biological resources include treatments that disturb soil and increase sedimentation, which could result in short-term adverse effects on water quality and aquatic species. In addition, removal of pinyon-juniper in riparian treatment areas could reduce stream shading, which could increase stream temperatures and adversely affect aquatic species. These adverse impacts generally would be short-term in duration (several months to several years), and would be addressed by resource protection measures implemented during and after the project treatment activities.

3.15.3.6 Relationship between the Local Short-term Uses and Maintenance and Enhancement of Long-term Productivity

As discussed under direct and indirect effects, treatments could lead to short-term habitat loss, and possibly loss of aquatic organisms, due to removal of vegetation and erosion. Long-term, control of aquatic and riparian vegetation would improve habitat quality for fish and other aquatic resources, improve hydrologic function, and reduce soil erosion. Vegetation treatments that reduce hazardous fuels would benefit aquatic organisms by reducing the chances of a large, uncontrolled wildfire, which could result in the destruction of a large amount of high quality wetland and riparian habitat, especially if followed by heavy rainfall. Hazardous fuels reduction would also decrease the likelihood that wildfire suppression activities would occur in or near aquatic habitats. Treatments that restore natural fire regimes and native vegetation near streams should ensure a steady supply of large woody debris that would provide habitat for aquatic organisms in the long-term (USDOI BLM 2007b:4-248).

3.15.3.7 Irreversible and Irretrievable Commitment of Resources

Loss of control over a prescribed fire could also harm aquatic habitat and cause mortality or injury to aquatic organisms. Treatments would likely result in short-term habitat degradation and some reduction in populations of fish and other aquatic organisms. These effects, however, would be reversible, as habitats would improve and aquatic organism populations would likely increase as a result (USDOI BLM 2007b:4-252).

3.15.3.8 Significance of the Effects under the Alternatives

3 Bars Project restoration treatments and other actions in the CESA should not have a significant adverse impact on fish and other aquatic resources. One of the goals of the 3 Bars Project is to improve habitat for Lahontan cutthroat trout and other fish and wildlife by restoring stream and habitat functionality through in-channel activities such as re-contouring and installing grade-control structures and plantings. Treatments could occur on several miles of streams annually and could lead to short-term stream channel instability and degradation. The BLM would also remove encroaching pinyon-juniper and noxious weeds and other invasive non-native vegetation on about 3,900 acres of riparian habitat, and revegetate treatment areas with native vegetation. The BLM would work with the USFWS and NDOW to ensure that treatments would not result in a long-term (greater than 3 year in duration) alteration or loss of habitat in streams or springs containing Lahontan cutthroat trout (current populations or recovery sites). The BLM also may exclude livestock, wild horse, and other wild ungulate access to treated areas until site-specific treatment goals and objectives were met. These treatments are expected to improve stream habitat within 2 to 3 years. Stream restoration is not planned on other portions of the CESA, but could occur in the future should funding become available.

Nearly all 3 Bars Project restoration treatments would cause short-term erosion that leads to increased sedimentation in streams or ponds that could harm aquatic species, and which could last for several years. These risks would be greatest in restoration areas with moderate to severe water or wind erosion potential, or where soils are susceptible to fire degradation. Treatments that disturb the soil or remove large amounts of vegetation, including use of mechanical treatments such as discing and plowing, and prescribed fire and wildland fire for resource benefit, would also lead to short-term erosion and sedimentation. Long-term, restoration treatments would lead to conditions that should reduce the risk of erosion, including revegetation of treatment sites with native vegetation and conducting treatments to stimulate growth of the understory. Treatments that reduce the risk of wildfire, including hazardous fuels treatments, control non-native vegetation, and create fire and fuel breaks would also reduce the risk of fire-associated erosion and its effects on water quality. Thus, none of the alternatives would result in a significant long-term (greater than 3 years) increase in erosion and the associated increased sedimentation in streams or ponds.

Under all alternatives, there is potential for short-term releases of fuels and lubricants from equipment into water bodies that could affect Lahontan cutthroat trout or other aquatic species, although this risk would be negligible. The BLM would prevent or minimize the movement of fuels and lubricants into water bodies by fueling and servicing equipment off-site at least 300 feet from streams. Operators would also carry absorbent material and other spill clean-up materials to use should a spill occur in a water body. By retaining buffers between treatment areas and water bodies where feasible, and following other SOPs that protect water quality, it is unlikely that there would be a change in water quality that would often or regularly exceed Nevada water quality standards.

Treatments under all alternatives would not cause a flow reduction lasting more than 1 month in streams containing Lahontan cutthroat trout (current populations or recovery sites), or other aquatic species. The BLM could divert water while reconstructing streams. The BLM may exclude livestock, wild horse, and other wild ungulate from treatment sites near water in riparian and aspen treatment areas until these areas were restored and able to accommodate use by these animals. It is anticipated that access restrictions would be 2 to 3 years. If access is restricted, the BLM would work with affected permittee(s) to ensure access to water. Thus, there should be no significant long-term diversion, or access restriction that substantially reduces water availability and the uses recognized by Nevada Department of Water Resources in the analysis area or immediately adjacent to it under all alternatives. This would include flows and seasons of use in springs or streams where existing beneficial water uses, as defined by Nevada Division of Environmental Protection and recorded by Nevada Department of Water Resources, may be affected.

Poorly designed, installed, or maintained culverts have impacted stream flows and fish movement on several streams on the 3 Bars Project area (AECOM 2010). The BLM would work to replace these culverts, and would ensure that any future culverts used in stream reconstruction would not cause permanent barriers to fish movement in streams.

3.15.4 Mitigation

The following mitigation measures would be implemented to reduce or avoid impacts to fish and other aquatic biological resources:

1. If instream disturbance is required as part of treatment, activities would be scheduled to avoid spawning periods of game fish species or Lahontan cutthroat trout. The measure would be effective in protecting spawning periods of game or special status fish species.

2. If water is required for fire control, perennial streams with game or special status species or springs with connections to these perennial streams would not be used as water sources. This measure would be effective

in avoiding flow reductions in streams with important aquatic species by restricting their use as water sources for fire control.

3. The BLM would consult with the NDOW before conducting prescribed fire and other treatments that could adversely impact Lahontan cutthroat trout when working near Lahontan cutthroat trout occupied or potential habitat. The measure would be effective in protecting stream habitat for Lahontan cutthroat trout.

In addition, fish and other aquatic resources would benefit from mitigation measures identified in Section 3.18.4 (Livestock Grazing Mitigation).

3.16 Wildlife Resources

3.16.1 Regulatory Framework

3.16.1.1 Endangered Species Act

In accordance with Section 7 of the Endangered Species Act, federal agencies must "insure that any action authorized, funded, or carried out by such agency is not likely to jeopardize the continued existence of any listed species or result in the destruction or adverse modification of critical habitat of such species." The purpose of the Act is to provide a means for conserving the ecosystems upon which threatened and endangered species depend, and to provide a program for protecting these species. The Act defines an endangered species as a species that is in danger of extinction throughout all or a major portion of its range. A threatened species is defined as any species that is likely to become an endangered species within the foreseeable future throughout all or a major portion of its range. This Act also addresses species that have been proposed for listing as either threatened or endangered, but for which a final determination has not been made. These so-called "candidate" species are those for which the USFWS has sufficient information on their biological status and threats to propose them as endangered or threatened under the Act, but for which development of a proposed listing regulation is precluded by other, higher priority listing activities. Critical habitat is a specific area or type of area that is considered to be essential for the survival of a species, as designated by the USFWS under the Act. The yellow-billed cuckoo is the only federally listed wildlife species on the 3 Bars ecosystem; the Columbia spotted frog is a candidate for listing; and the Greater sage-grouse is a special status species.

3.16.1.2 BLM Special Status Species

BLM Special Status Species are defined as those plant and animal species for which population viability is a concern, as evidenced by a significant current or predicted downward trend in population numbers or density, or a significant current or predicted downward trend in habitat capability that would reduce the species' existing distribution. These animals are protected under provisions of the Act or under BLM Manual 6840, *Special Status Species Management* (USDOI BLM 2008h). In addition, there is a Nevada State Protected Animal List (Nevada Administrative Code §§ 501.100 - 503.104) that BLM has incorporated, in part, into the Special Status Species list. The Greater sage-grouse is protected under the September 2015 *Nevada and Northeastern California Greater Sage-Grouse Approved Resource Management Plan Amendment and Record of Decision* (ARMPA).

3.16.1.3 BLM and Nevada Department of Wildlife Memorandum of Understanding

Wildlife and fish resources and their habitat on public lands are managed cooperatively by the BLM and NDOW under a Memorandum of Understanding as established in 1971. The Memorandum of Understanding describes the

BLM's commitment to manage wildlife and fisheries resource habitat, and the NDOW's role in managing populations. The BLM meets its obligations by managing public lands to protect and enhance food, shelter, and breeding areas for wild animals. The NDOW assures healthy wildlife numbers through a variety of management tools including wildlife and fisheries stocking programs, hunting and fishing regulations, land purchases for wildlife management, cooperative enhancement projects, and other activities.

3.16.1.4 Nevada Department of Wildlife Programs

The NDOW is responsible for the restoration and management of fish and wildlife resources within the state. The NDOW administers state wildlife management and protection programs as set forth in Nevada Revised Statutes Chapter 501, Wildlife Administration and Enforcement, and Nevada Administrative Code Chapter 503, Hunting, Fishing and Trapping; Miscellaneous Protective Measures. Nevada Revised Statute § 501.110 defines the various categories of wildlife in Nevada, including protected categories. Nevada Administrative Code §§ 503.010 to 503.080, 503.110, and 503.140 list the wildlife species currently placed in the state's various legal categories, including protected species, game species, and pest species.

3.16.1.5 Migratory Bird Treaty Act and Migratory Bird Conservation Act

Migratory birds, with the exception of native resident game birds, are protected under the provisions of the Migratory Bird Treaty Act of 1918. Under this act, nests with eggs or the young of migratory birds may not be harmed, nor may any migratory birds be killed. Measures to prevent bird mortality must be incorporated into the project's design.

The Migratory Bird Conservation Act of 1929, as amended, makes it unlawful to directly or indirectly harm migratory birds. If the USFWS determines that migratory birds could be harmed by BLM vegetation treatment actions, the two agencies would develop a site-specific assessment and mitigation to prevent harm to these birds.

Per the *BLM Nevada Wildlife Surveys* protocol, the BLM is required to conduct migratory bird surveys in and adjacent to (within 100 meters; 328 feet) a project area prior to disturbance. These surveys are adequate for up to 14 days. Additional surveys must be conducted after 14 days have elapsed if the project has not been implemented (USDOI BLM 2013j).

3.16.1.6 Bald and Golden Eagle Protection Act

The Bald and Golden Eagle Protection Act (16 USC § 668) applies primarily to taking, hunting, and trading activities that involve any bald or golden eagle. The Act prohibits the direct or indirect take of an eagle, eagle part or product, nest, or egg. The term "take" includes "pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest, or disturb." Disturb is defined as to "agitate or bother a bald or golden eagle to a degree that causes, or is likely to cause, based on the best scientific information available: 1) injury to an eagle, or 2) a decrease in its productivity, by substantially interfering with normal breeding, feeding, or sheltering behavior, or 3) nest abandonment, by substantially interfering with normal breeding, feeding, or sheltering behavior." Golden eagles are protected by the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act, both of which prohibit take. Prior to conducting a treatment, the BLM would survey for eagles as per guidance in the *BLM Nevada Wildlife Surveys* protocol (USDOI BLM 2013j).

3.16.1.7 Other Regulations

The Sikes Act is federal legislation that authorizes the USDOI to plan, develop, maintain, and coordinate programs with state agencies for the conservation and rehabilitation of wildlife, fish, and game on public lands. The Fish and Wildlife Conservation Act of 1980 encourages federal agencies to conserve and promote the conservation of non-game fish and wildlife species and their habitats.

3.16.2 Affected Environment

3.16.2.1 Study Methods and Analysis Area

The NDOW provided a list of wildlife species that have been observed within the project area, or which NDOW biologists believe have a strong potential to occur within the project area, based on knowledge of the species' habitat preference and conditions. BLM biologists reviewed these lists prior to their incorporation into this document. The NDOW *Wildlife Action Plan* and the NDOW *Draft Nevada Wildlife Action Plan Public Review* provided information about key habitats and the species that depend on them, including species descriptions, range maps, and habitat needs (Wildlife Action Plan Team 2006, 2012). The *Revised Nevada Bat Conservation Plan* provided in-depth analysis of Nevada's bat species, habitat and conservation needs, and distribution (Bradley et al. 2006). The *Nevada Comprehensive Bird Conservation Plan* was used as a supplemental resource for information about bird life history and habitats, especially for those species not covered in either the 2006 or 2012 Wildlife Action Plans (Great Basin Bird Observatory 2010).

Several previous studies in or near the project area provided useful reference and analysis relevant to the proposed project. The most significant of these was the Mount Hope Project EIS (USDOI BLM 2012b). The Mount Hope Project is in the southeast corner of the 3 Bars Project area, and the study area for some aspects of the Mount Hope EIS included much the 3 Bars Project area. Finally, numerous Geographic Information System data files for wildlife species presence and seasonal habitat range were consulted in conjunction with the above referenced documents.

The project area for analysis of direct and indirect effects to wildlife resources is the 3 Bars Project area. The cumulative effects analysis area includes the 3 Bars Project area, and areas within 10 miles of the project area boundary, as shown in **Figure 3-1**.

3.16.2.2 Wildlife Habitat

Important wildlife habitat in the area includes big sagebrush (mountain, basin, and Wyoming big sagebrush), low sagebrush, pinyon-juniper woodlands, aspen, riparian, and salt desert scrub vegetation types. The components of these habitats are described in Section 3.12, Native and Non-native Vegetation Resources, while wetland, floodplain, and riparian habitats within the project area are described in Section 3.11, Wetlands, Floodplains, and Riparian Zones.

3.16.2.2.1 Sagebrush

Sagebrush communities in Nevada provide habitat for approximately 100 bird species and 70 mammal species, including at least 28 rodent species (Braun et al. 1976). Big sagebrush provides important habitat for many sagebrush obligate and facultative wildlife species. "Obligate" species are those that live only within a particular habitat type, while "facultative" species prefer a particular habitat, but are not restricted to it. Sagebrush lizard, Greater sage-grouse, sage thrasher, sage sparrow, Brewer's sparrow, sagebrush vole, pygmy rabbit, and pronghorn antelope are sagebrush obligate species (Paige and Ritter 1999, Knick et al. 2003). Low sagebrush areas provide seasonal habitat

for some species and year-round habitat for smaller animal species. Sagebrush provides important nesting and foraging habitat, and protection from predators and from the weather. The deep, often sandy or loose soils are easy to dig, and burrowing and denning species are common. Sagebrush range in good condition typically supports a lush undergrowth of bunchgrasses and forbs. This highly productive understory is critical to the needs of wildlife species, including sagebrush vole and several species of shrew that depend on the productivity of the grass component for both prey production and cover (Wildlife Action Plan Team 2012).

Wildfire, spread of noxious weeds and other invasive non-native species, and pinyon-juniper encroachment are major threats to sagebrush habitat and associated wildlife (Connelly et al. 2004). The decline in sagebrush habitat in the western U.S. has resulted in the Greater sage-grouse being petitioned for listing as threatened or endangered, and shrubland birds are declining faster than any other group of species in North America (Knick et al. 2003). The Brewer's sparrow population has declined by over 50 percent since 1966, and the loggerhead shrike population continues to decline across its range (Wildlife Action Plan Team 2012).

3.16.2.2.2 Pinyon- juniper Woodland

Pinyon-juniper woodlands provide a variety of sheltering functions for wildlife that range from hiding cover to cavities and nest sites for birds, bats, and small mammals. Numerous wildlife species frequent pinyon-juniper habitats in the western United States. At least 70 species of birds and 48 species of mammals have been associated with these woodlands (Gottfried et al. 1995). Over the past 150 years, pinyon-juniper has expanded into sagebrush, riparian, and aspen habitats, to the detriment of species that use these habitats. Ironically, despite the increase in amount of pinyon-juniper habitat on the landscape, resident seed and fruit eating bird species such as pinyon jay, western scrub jay, and mountain chickadee are undergoing substantial population declines in the pinyon-juniper biome, while migratory insectivore populations are little changed (Sauer et al. 2008 *cited in* Great Basin Bird Observatory 2011).

The pinyon-juniper woodlands provide important thermal protection for wildlife during winter, and shelter from the intense sun during the summer. For birds and bats in particular, pinyon-juniper woodlands provide structure for nesting and roosting and locations for foraging that would otherwise be missing from the mid-elevation cold desert. The pinyon nut crop is an important food source for a number of species, including pinyon jay and a variety of small mammals. The juniper berry crop is also an important food resource for birds and small mammals (Wildlife Action Plan Team 2012). Pinyon-juniper at different successional stages offers different benefits for different species, and pinyon-juniper communities can range from open stands with a diverse understory of shrubs and grasses to closed woodlands with little understory vegetation. Open pinyon-juniper/big sagebrush/bunchgrass stands are mid-successional and characterized by herbaceous, shrub, and tree layers, and often host a high diversity of wildlife species. As western juniper dominance increases, structural diversity declines. Old growth stands also differ structurally from post-settlement woodlands, including having a greater density of cavities, which benefits cavity nesting species (Miller et al. 2005).

3.16.2.2.3 Aspen and Riparian

Wildlife use riparian zones disproportionately more than any other type of habitat in the Great Basin (see review in Thomas et al. 1979, Wildlife Action Plan Team 2012). Riparian habitat in the Great Basin supports a rich diversity of wildlife, including more than one-half of the bird species that breed regularly in the Great Basin (Wildlife Habitat Council 2005). Riparian areas provide important habitat for numerous wildlife species on the 3 Bars Project area, but several species, including northern leopard frog, Lewis' woodpecker, northern goshawk, mountain quail, willow flycatcher, Cassin's finch, montane shrew, and numerous species of bats preferentially use riparian zones (USDOI BLM 2003b, Wildlife Action Plan Team 2012).

Biological diversity is higher in aspen stands than in any other upland forest type in the West (Finch and Ruggiero 1993 *cited in* Kay 2003). Numerous wildlife species use aspen areas and aspen stands typically have high bird abundance and richness, but several species, including Lewis' woodpecker, northern goshawk, Cassin's finch, mountain quail, mule deer, and numerous species of bats preferentially use aspen habitats on the 3 Bars Project area (Wildlife Action Plan Team 2012). Aspen are found on scattered tracts on the 3 Bars Project area, but their future is uncertain. Studies in California, Oregon, and Nevada have shown that 12 percent of aspen stands have been completely replaced by pinyon-juniper, and pinyon-juniper was dominant or co-dominant on another 65 percent of stands (Kerr and Salvo 2007). Studies in Nevada and on the 3 Bars Project area have shown that unless protected by fencing, aspen stands are degraded by livestock. In areas where aspens were protected from grazing, they successfully regenerated and formed multi-aged stands. Aspen have also declined from fire suppression, but even if burned, will not regenerate if ungulate herbivory is excessive (Kay 2001, 2003, USDOI BLM 2010d).

Aspen communities are particularly important to cavity nesting species in Nevada because stems attain sizes over 10 inches diameter at breast height and the wood is soft and easy to excavate. Because large diameter aspen occur more frequently in riparian aspen stands, these areas tend to be preferred by cavity nesting species. In addition to cavities and peeling bark, mature aspen communities provide larger diameter trees utilized by wildlife as forage substrate or nesting. For example, northern goshawks can live in and utilize high-elevation shrub-steppe habitats because stringers of large-diameter aspen trees with closed canopies in the riparian zones will support their nesting needs. Birds and small mammals utilize mid-story structure and herbaceous/shrub understory of aspen communities for forage, nesting, and protective cover. Downed trees in aspen habitat can create slow moving water conditions favorable to Columbia spotted frog, a federal candidate species and BLM Special Status Species.

3.16.2.2.4 Salt Desert Scrub

The intermountain cold desert shrub, including salt desert scrub, is the most important habitat in Nevada for several BLM Special Status Species, including pale kangaroo mouse and loggerhead shrike. The shrub habitat provides nesting structure and protection from predators and the weather. This habitat is important to loggerhead shrike, which can attain high breeding densities in valley bottoms where individual shrubs can be quite large and provide good cover and nest protection. Soils tend to be loose and either sandy or gravelly and are often easy to dig, providing important denning and burrowing habitat. Small and medium mammals including rabbits, jackrabbits, and various rodents that forage in the brush serve as prey for raptors. Washes provide unique habitat for certain terrestrial species including amphibians. By retaining higher soil moisture than surrounding upland areas, they can serve as enhanced movement and migration pathways for these species and facilitate their distribution across the landscape, perhaps serving an important role in amphibian metapopulation maintenance. As a result of the limited water availability associated with salt desert scrub, the habitat is used seasonally by larger animals and provides a lower abundance of smaller animals than found in the more mesic plant communities (Wildlife Action Plan Team 2012).

3.16.2.3 Wildlife Species

Wildlife species and habitats occurring in the project area are typical of the central Basin and Range region, and are relatively abundant within and adjacent to the project area. Wildlife species that are not special status species are discussed below; a discussion of special status species, such as those listed as federally threatened or endangered, or BLM Special Status Species, follows. These discussions only address a portion of the wildlife species that occur within the 3 Bars Project area, and focus on those species where the BLM has the most information.

3.16.2.3.1 Reptiles and Amphibians

Records for amphibian occurrence within the project study area are lacking. Based on amphibian records in areas adjacent to the project study area, species occurrence could include the Great Basin spadefoot toad, western toad, northern leopard frog, and Columbia spotted frog (Petersen 2012). The Columbia spotted frog is discussed under BLM Special Status Species.

Potential habitat for amphibians within the project study area includes springs, wet areas, and streams. Many of the toad species, such as Great Basin spadefoot, utilize terrestrial habitats throughout most of the year, but they move to aquatic habitats for breeding in the spring or early summer.

The northern leopard frog was petitioned for listing, but the status review and 12-month finding concluded that listing the western population is not warranted at this time (USDOI USFWS 2011). Habitat for northern leopard frog typically includes springs and wet areas. Breeding typically occurs in the spring or early summer for leopard frogs.

There are a variety of snakes and lizards that are known either to occur or have the potential to occur within the project area, in almost every habitat type. Likely species include rubber boa and ringneck snake, which can occupy a variety of grassland and woodland habitats including aspen woodlands, and often occur near riparian zones. The greater short-horned lizard also uses a variety of habitats including sagebrush, and open pinyon-juniper woodlands, and prefers areas where substrate is stony, sandy, or firm, but usually where there is some fine loose soil**.** Desert horned lizard and long-nosed leopard lizard tend to prefer arid shrublands, and may occur in the project area, and the great basin rattlesnake is likely to occur in the broken rocks and brush habitats within the project area. Other reptiles known or likely to occur in the project area include coachwhip, common sagebrush lizard, great basin collared lizard, western fence lizard, long-nosed snake, and striped whipsnake (NDOW 2008a, 2009b, Wildlife Action Plan Team 2012).

3.16.2.3.2 Birds

Waterfowl

Waterfowl and wading birds occur in shallow lakes, marshes, grassy meadows, and wetlands. These birds may use the project area for breeding, as a wintering ground, as year-round habitat, or during migration. Snow geese, tundra swans, and other waterfowl overwinter within the project area, while mallards and Canada geese overwinter and breed here. Great blue heron forage in shallow water and marshy areas year-round, while populations of American bittern, black-crowned night heron, and sora use these habitat areas during the breeding season. Other species of waterfowl, including several species of teal as well as egret, rails, and coots, are known to occur in the project area. Migratory and breeding populations of sandhill crane use the wet meadows, riparian zones, and agricultural lands for foraging, and often congregate in large numbers in eastern Nevada, including all of Eureka County (Wildlife Action Plan Team 2006, 2012, Great Basin Bird Observatory 2010, Cornell Lab of Ornithology 2011).

Doves and Quail

Mourning dove and chukar partridge are small game birds that occur on the project area. Mourning doves primarily inhabit open country, areas with scattered trees, and woodland edges, and forage for seeds on the ground. They are frequently found along unimproved roads where they obtain gravel for food digestion, or near springs and artificial sources of water (Cornell Lab of Ornithology 2011, USDOI BLM 2012b). Mourning doves are a year-round resident in Nevada (Otis et al. 2008). Chukar partridge were introduced to Nevada in the 1940s and are now widely distributed. Optimum habitat for chukar partridge consists of steep rugged canyons with numerous talus slopes and rocky outcrops; the species typically inhabits rock outcrops and ledges adjoining grassy and sagebrush hillsides. Chukar partridge eat a variety of leafy green food, weed seeds, fruits, berries, insects, and beetles. Chukar partridge are common in the Roberts Mountains, Whistler Mountain, and Sulphur Spring Range. Occupation of seasonal habitat varies with moisture and snow levels. The birds typically move to lower elevations and south-facing slopes during heavy snow events, and concentrate around water sources during the summer months (USDOI BLM 2012b).

Raptors

A variety of raptors are known to use the project area for roosting, nesting, and/or hunting. Golden eagle, northern harrier, prairie falcon, Cooper's hawk, ferruginous hawk, red-tailed hawk, Swainson's hawk, sharp-shinned hawk, American kestrel, and western burrowing owl have been known to nest in the area. Nesting data since 2006 indicates active use of the area by prairie falcons, and kestrels. Northern goshawk, a BLM Special Status Species, occurs in riparian habitat in the Roberts Mountains area. There are also numerous historic nesting records for ferruginous hawk, another BLM Special Status Species, within open habitat areas of the 3 Bars project area, including a site in the southeastern section of the project area that has been used within the past 10 years, Flammulated owls may occur in woodland areas in the north-central part of the project area. Additional raptors sighted in the area include merlin and rough-legged hawk (Wildlife Action Plan Team 2006 and 2012, NDOW 2009c, 2010a, USDOI BLM 2012b).

Migratory Birds

Neo-tropical migrant birds are bird species that migrate from the temperate portions of the continent to winter in the tropics of North and South America. Neo-tropical migrants are most commonly associated with habitats having a strong vertical component of woody shrubs and trees. A number of migratory birds that breed in North America and winter in the neotropical region of South America also breed in the project area and vicinity.

Species commonly occurring in pinyon-juniper habitats and that are known to occur or have the potential to occur in the project area include the pinyon jay, western bluebird, Virginia's warbler, black-throated gray warbler, and Scott's oriole. Sage thrasher, Brewer's sparrow, and sage sparrow use sagebrush habitats within the project area, while loggerhead shrike and green-tailed towhee also have potential to occur in the sagebrush habitats in the project area. Gray flycatcher is known to occur within the project area and may use pinyon-juniper, tall sagebrush, or riparian habitats (Great Basin Bird Observatory 2010, USDOI BLM 2012b, Wildlife Action Plan Team 2012). Other migratory species known to occur within the project area include common nighthawk, common raven, mountain bluebird, black-throated sparrow, lark sparrow, and western meadowlark.

3.16.2.3.3 Mammals

Large Game

Mule deer use a variety of vegetation types and habitats seasonally within the project area in their pursuit of forage, thermal cover, and escape cover for seasonal needs. Vegetation important for mule deer includes serviceberry, snowberry, mountain mahogany, sagebrush, aspen, cottonwood, willow, chokecherry, wild rose, singleleaf pinyon pine, Utah juniper, eriogonum, arrowleaf balsamroot, penstemon, phlox, sorrel, hawksbeard, lupine, and numerous forbs. Riparian vegetation along streams, meadow areas, and aspen stands are important fawn-rearing areas (USDOI BLM 2007g). Six mule deer herds have all or a portion of their range within the project area, including the Sulphur Spring herd, Whistler herd, Fish Creek herd, Roberts Mountain herd, Simpson Park herd, and Cortez Mountains herd (**Figure 3-39**). Mule deer habitat is concentrated primarily in the eastern half of the project area, including the Roberts Mountains area, and in the Simpson Park area.

Habitat for mule deer over much of the 3 Bars Project Area is in decline, and proposed treatments are designed to slow or reverse this trend (**Figure 3-40**). Factors contributing to this decline include pinyon-juniper encroachment into shrublands, decadent and unhealthy pinyon-juniper stands, high levels of hazardous fuels that could lead to a catastrophic wildfire and loss of deer habitat, livestock grazing, noxious weeds and other invasive non-native vegetation, and human-related disturbance.

The mule deer population in NDOW hunt units 141 through 145 has been stable to slightly increasing from 2009 to 2011, with a December 2011 population estimate of nearly 1,500 animals (NDOW 2012b, c). The Roberts Mountains deer are migratory in nature. Mule deer leave Roberts Mountains in October or November and migrate south into the Mountain Boy and Fish Creek Ranges south of U.S. Highway 50. The migration pattern includes moving south from Roberts Creek Ranch to Lone Mountain and from Henderson Summit along Whistler Mountain to Devils Gate (USDOI BLM 2012b).

Pronghorn antelope occupy the lowlands and the foothills of the project area and are mostly absent from the Roberts Mountains area (**Figure 3-41**; NDOW 2008b). Pronghorn numbers have increased throughout the area in recent years, partially in response to vegetation changes resulting from past range fires. Wyoming big sagebrush habitat is particularly important to pronghorn (Tsukamoto 2003). Important vegetation species for pronghorn include low sage, black sage, serviceberry, shadscale, winterfat, rabbitbrush, greasewood, ricegrass, needlegrasses, lupine, spurge, balsamroot, several eriogonum species, scarlet globe-mallow, phlox, locoweed, and other perennial forbs. Ten antelope herds have all or a portion of their range within the project area. The 2006 population estimate for the NDOW hunt units was 450 animals, up from 240 in 2002, and population growth was observed in 2011 (NDOW 2012b). The pronghorn antelope population in Kobeh Valley is low and variable with most of the antelope observed in the southern part of the valley near Lone Mountain and U.S. Highway 50 (USDOI BLM 2012b).

Habitat for pronghorn antelope over much of the 3 Bars Project Area is in decline, and proposed treatments are designed to slow or reverse this trend (**Figure 3-41**). Factors contributing to this decline include pinyon-juniper encroachment into shrublands, high levels of hazardous fuels that could lead to a catastrophic wildfire and loss of pronghorn antelope habitat, livestock grazing, noxious weeds and other invasive non-native vegetation that displace native forbs and grasses, dense stands of Wyoming big sagebrush, and human-related disturbance.

Bighorn sheep occur in mesic to dry grasslands or shrub-steppe in mountains, foothills, or river canyons, in areas with access to steep, rugged terrain for escape from predators. While historic populations of bighorn sheep were in most

mountain ranges within Nevada, there are no known bighorn sheep populations with the 3 Bars Project area. The most recent NDOW sighting for bighorn sheep in the project area was in 1983, on the east side of the Roberts Mountains (NDOW 2008a, 2010b). Potential habitat for bighorn sheep exists in the Roberts Mountains area, the Whistler Range, Lone Mountain, the Simpson Park Mountains, and the Cortez Mountains (NDOW 2010b).

Other Mammals

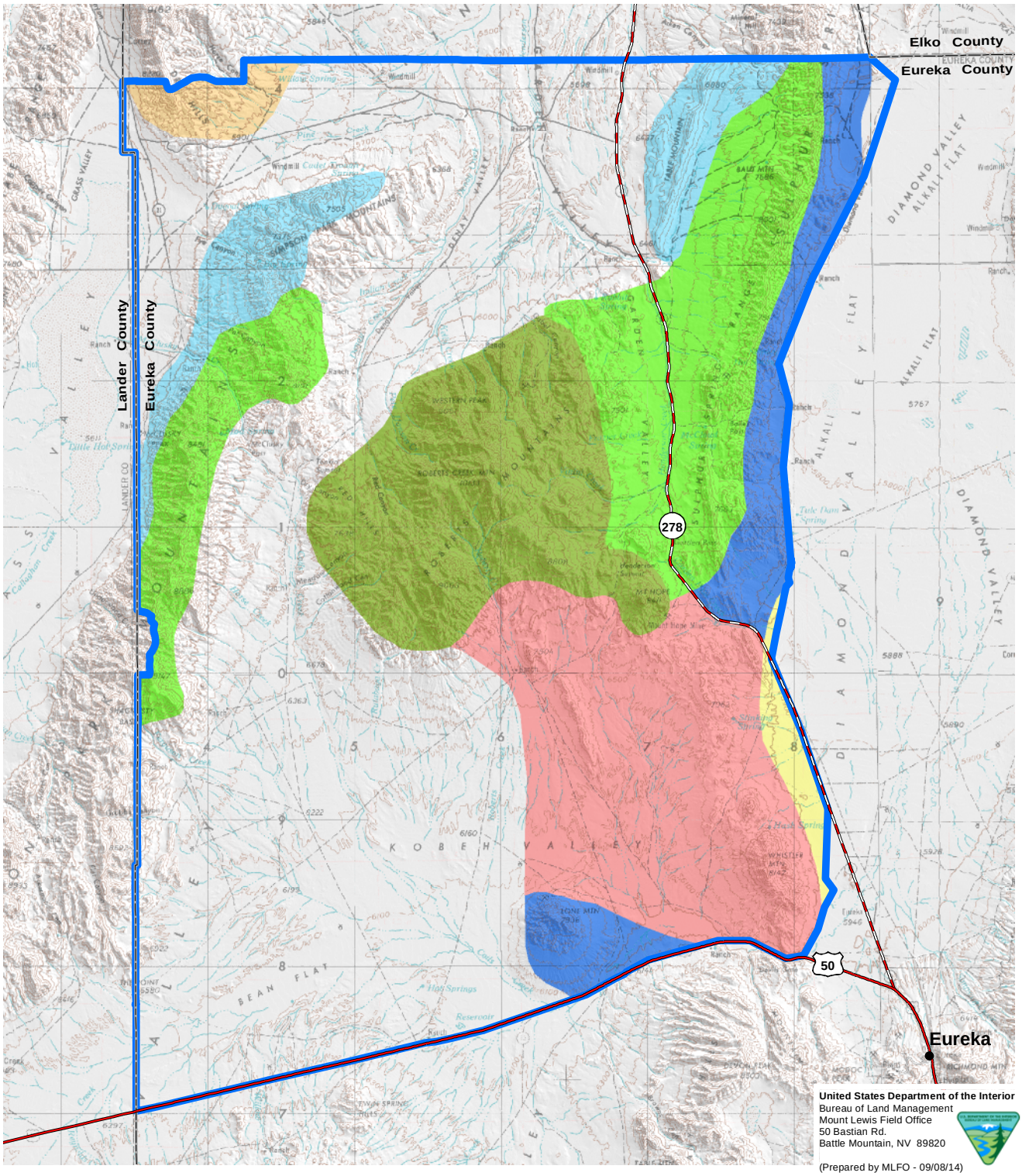
Cougars are found primarily in the mountainous portions of the 3 Bars Project area, and bobcats have been seen throughout the 3 Bars Project area, including near Table Mountain in the Sulphur Spring Range, along Vinini Creek on the Roberts Mountains, and in the central area south of Roberts Mountains. Coyotes occupy almost all habitat types and have been observed in the southern part of the project area (NDOW 2012d). One of the most diverse groups represented in the project area is rodents, with species of chipmunks, mice, ground squirrels, jumping mice, kangaroo rats, and voles present throughout. Members of the rabbit family, including pygmy rabbit, black-tailed jackrabbit, and mountain cottontail, also occur in the project area (USDOI BLM 2012b). Pika could be found on Roberts Mountains.

The *Revised Nevada Bat Conservation Plan* and NDOW data show several records for bat occurrences within the project area. Bats inhabit or utilize many niches across the 3 Bars landscape. These include caves, abandoned mines, cliffs, springs, riparian, aspen, pinyon-juniper, subalpine coniferous forest, and desert shrub habitats. The only documented bat occurrences in the project area are for long-eared myotis, which has been recorded on the eastern edge of the project area and in the Roberts Mountains. Townsend's big-eared bat and western small footed myotis may occur on the southeastern edge of the project area (Bradley et al. 2006, NDOW 2008a). Bat species are discussed in greater detail in the Special Status Species section.

3.16.2.3.4 Special Status Species

The following discussion of BLM Special Status Species is based on two lists: the BLM's Special Status Species list for the Battle Mountain District, and the NDOW list of species known to occur within the 3 Bars Project area or that NDOW biologists believe have the potential to occur within the project area, based on habitat needs and habitat conditions (NDOW 2012d). The lists were cross-referenced with each other to obtain a list of Special Status Species known to occur or with potential to occur within the 3 Bars Project area. NDOW Geographic Information System data were used to verify whether there are current or historic occurrences of a species within the project area, but because absence of a Geographic Information System record does not necessarily indicate that the species is absent, only that no record has been made of its presence in a particular location, the following section considers all BLM Special Status Species suspected or known to occur within the 3 Bars Project area.

Table 3-45 lists the special status species within the Project Area. Of these, the yellow-billed cuckoo is the only species federally listed as threatened or endangered; and the Columbia spotted frog is a federal candidate species.



Legend

Mule Deer Habitat
- Summer Range
- Crucial Summer Range
- Winter Range
- Crucial Winter Range
- Transition Range
- Year-round Range
- Agricultural Lands/ Unique Habitat
- 3 Bars Project Area

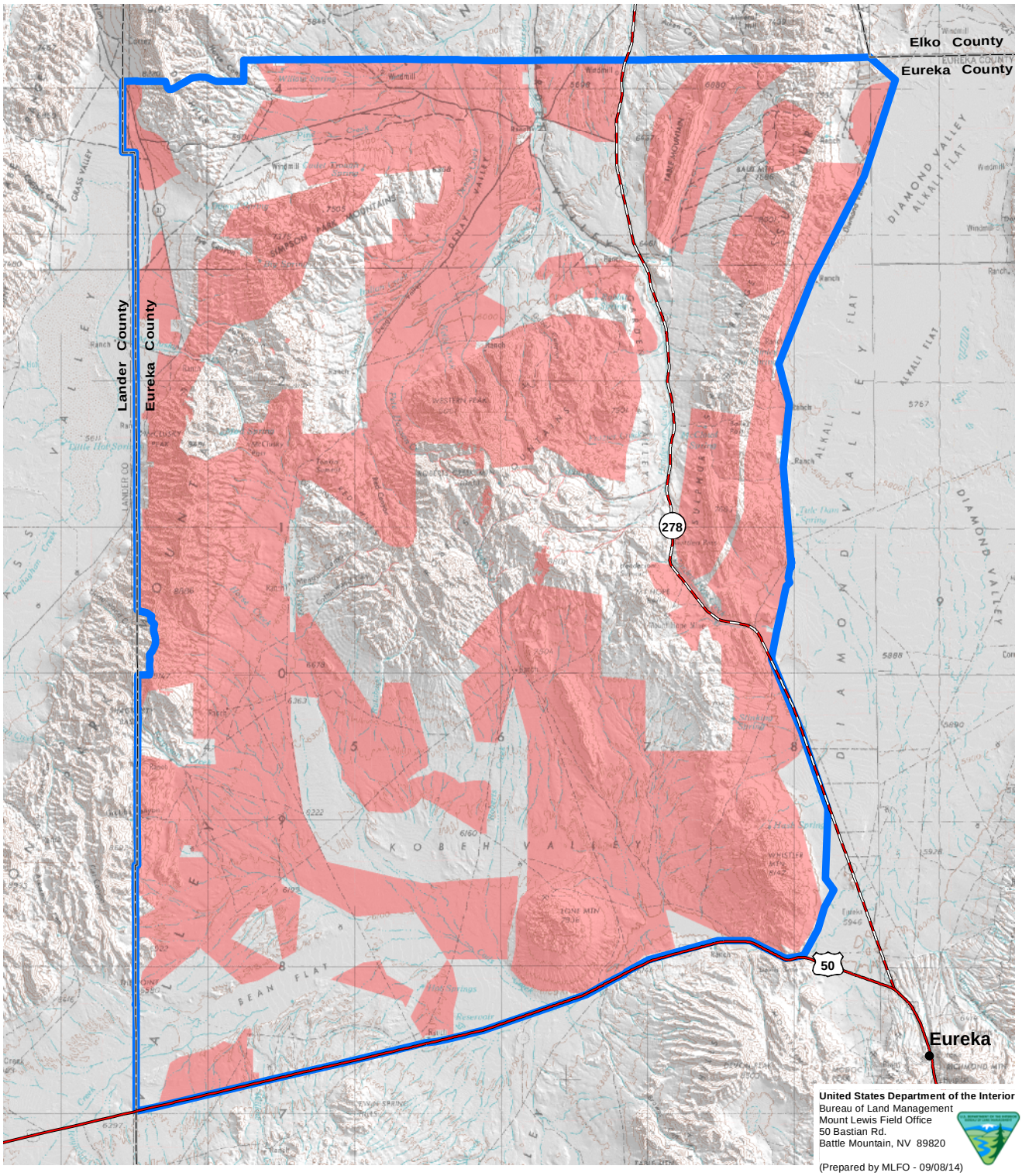
Source: NDOW 2009d.

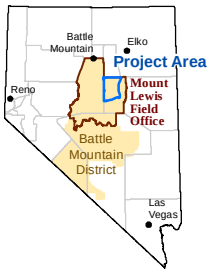
3 Bars Ecosystem and Landscape Restoration Project

Figure 3-39

Mule Deer Habitat

0 1 2 3 4 5 10 Miles
0 1 2 3 4 5 10 Kilometers
N





Legend

- Degraded Habitat
- 3 Bars Project Area

Source: BLM 2009a.

3 Bars Ecosystem and Landscape Restoration Project

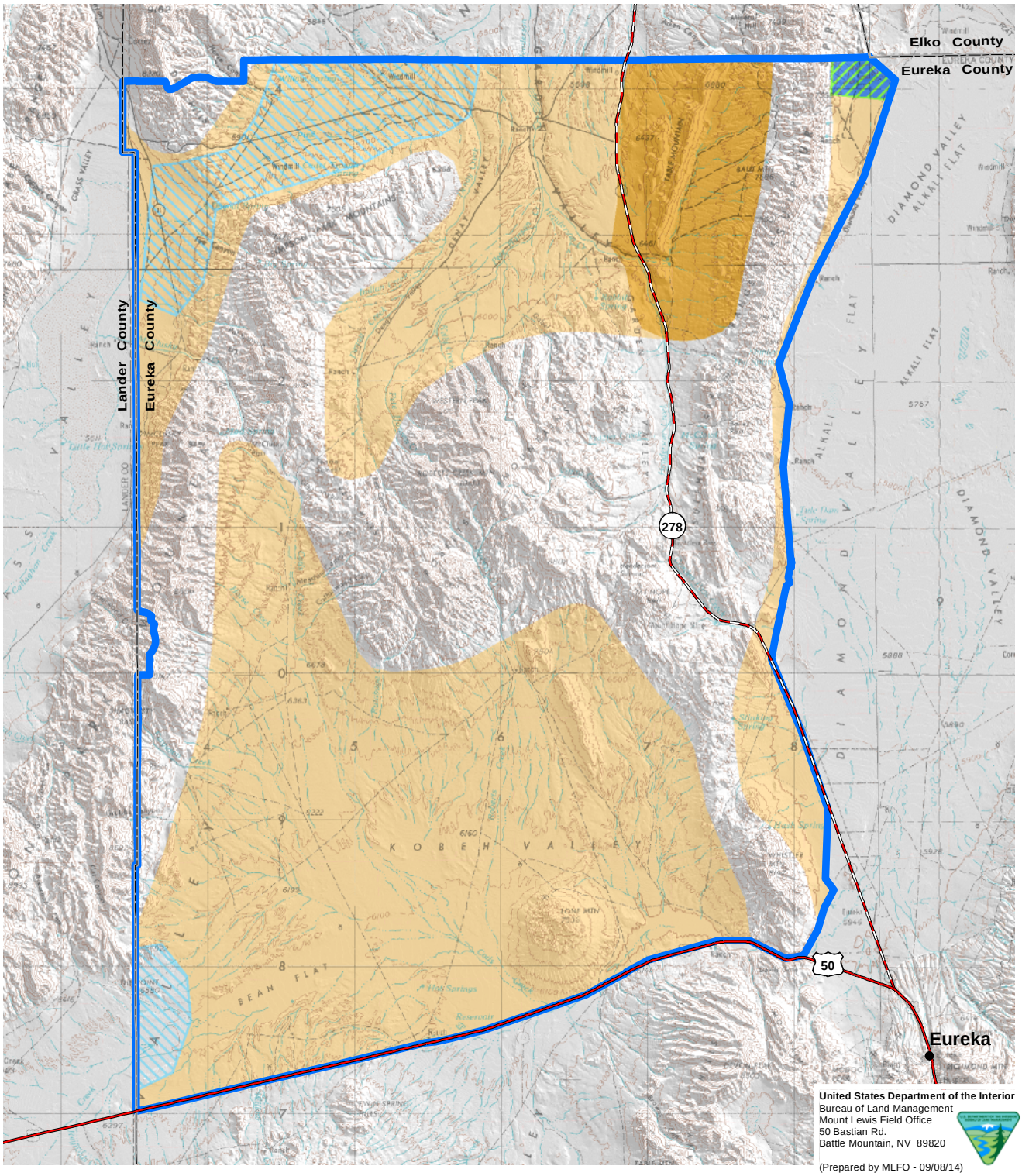
Figure 3-40

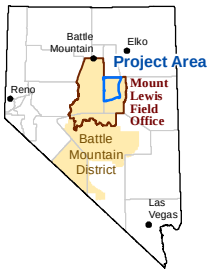
Areas with Degraded Habitat Conditions

0 1 2 3 4 5 10 Miles

0 1 2 3 4 5 10 Kilometers

N





Legend

Pronghorn Habitat

- Summer Range
- Winter Range
- Crucial Winter Range
- Year-round Range
- Crucial Year-round Range
- 3 Bars Project Area

Source: NDOW 2008b.

3 Bars Ecosystem and Landscape Restoration Project

Figure 3-41

Pronghorn Habitat

0 1 2 3 4 5 10 Miles

0 1 2 3 4 5 10 Kilometers

N

Amphibians

Columbia Spotted Frog

Columbia spotted frogs are closely associated with clear, slow-moving or ponded surface waters, with little shade, and relatively constant water temperatures. Breeding and egg-laying occurs in waters with floating vegetation and larger ponds such as oxbows, lakes, stock ponds, and beaver-created ponds; in some areas, this species is critically tied to beaver ponds. Adults are opportunistic feeders, and eat insects, mollusks, crustaceans, and spiders. Tadpoles eat decomposed plants and live green algae.

Columbia spotted frogs occur in three geographically separated subpopulations in the Jarbidge and Independence Mountains, the Ruby Mountains, and in the Toiyabe Mountains. There are no recorded occurrences in the project area.

TABLE 3-45

Special Status Species Known or with Potential to Occur on the 3 Bars Project Area

Common Name/Group	Scientific Name	Status	Habitat
REPTILES AND AMPHIBIANS			
Columbia spotted frog	*Rana luteiventris*	Federal Candidate	Clear, open, slow moving or still water with consistent temperature.
BIRDS			
Bald eagle	*Haliaetus leucocephalus*	BLM Sensitive	Large conifers for roosting.
Black rosy-finch	*Leucosticte atrata*	BLM Sensitive	Barren, rocky, or grassy areas and cliffs among glaciers or above timberline.
Brewer's sparrow	*Spizella breweri*	BLM Sensitive	Sagebrush and large openings in pinyon-juniper.
Ferruginous hawk	*Buteo regalis*	BLM Sensitive	Pinyon-juniper edges, sagebrush, and other open areas and wooded edges.
Golden eagle	*Aquila chrysaetos*	BLM Sensitive	Open or sparsely wooded habitats in mountainous areas.
Greater sage-grouse	*Centrocercus urophasianus*	BLM Sensitive	Sagebrush.
Lewis' woodpecker	*Melanerpes lewis*	BLM Sensitive	Aspen and riparian.
Loggerhead shrike	*Lanius ludovicianus*	BLM Sensitive	Desert scrub, especially creosote bush. Nests in sagebrush.
Northern goshawk	*Accipiter gentilis*	BLM Sensitive	Aspen and riparian.
Peregrine falcon	*Falco perigrinus*	BLM Sensitive	Desert scrub, including sage and steppe habitat near cliffs.
Pinyon jay	*Gymnorhinus cyanocephalus*	BLM Sensitive	Pinyon-juniper.
Sage thrasher	*Oreoscoptes montanus*	BLM Sensitive	Sagebrush.
Swainson's hawk	*Buteo swainsoni*	BLM Sensitive	Wooded riparian near sage and brushland.

TABLE 3-45 (Cont.)

Special Status Species Known or with Potential to Occur in the 3 Bars Project Area

Common Name/Group	Scientific Name	Status	Habitat
BIRDS (Cont.)			
Western burrowing owl	*Athene cunicularia*	BLM Sensitive	Sagebrush.
Yellow-billed cuckoo	*Coccyzus americanus*	Threatened	Riparian obligate and dense riparian cottonwood-willow stands.
MAMMALS			
California myotis	*Myotis californicus*	BLM Sensitive	Desert to forest.
Dark kangaroo mouse	*Microdipodops megacephalus*	BLM Sensitive	Sagebrush.
Fringed myotis	*Myotis thysanodes*	BLM Sensitive	Desert to forest.
Hoary myotis	*Lasiurus cinereus*	BLM Sensitive	Forests/woodlands, including pinyon-juniper and forested riparian zones.
Little brown bat	*Myotis lucifugus*	BLM Sensitive	Associated with coniferous forest with a nearby water source.
Long-eared myotis	*Myotis evotis*	BLM Sensitive	Coniferous forests.
Long-legged myotis	*Myotis volans*	BLM Sensitive	Pinyon-juniper woodland and montane coniferous forests. May use shrub habitat including sagebrush.
Pygmy rabbit	*Brachylagus idahoensis*	BLM Sensitive	Sagebrush.
Silver-haired bat	*Lasionycteris noctivagans*	BLM Sensitive	Forests and wooded areas near water, including pinyon-juniper forests and wooded riparian corridors.
Townsend's big-eared bat	*Corynorhinus townsendii*	BLM Sensitive	Caves and mines in a variety of habitats, including pinyon-juniper and mahogany woodlands.
Western pipistrelle	*Parastrelluss hesperus*	BLM Sensitive	Desert habitats including sagebrush, and occasionally in pinyon-juniper habitat with rock outcrops and canyons.
Western small-footed myotis	*Myotis ciliolabrum*	BLM Sensitive	Various, including grasslands, shrubland, coniferous forest, and urban settings.

Sources: Bradley et al. (2006), Great Basin Bird Observatory (2010), and Wildlife Action Plan Team (2012).

Birds

Greater Sage-grouse

Greater sage-grouse are largely dependent on sagebrush for nesting and brood rearing and feed almost exclusively on sagebrush leaves during the winter. Greater sage-grouse are known to occur in foothills, plains, and mountain slopes where sagebrush meadows and aspen are in close proximity. A dense sagebrush overstory and an herbaceous

understory of grasses are important to provide shade and security, and both new herbaceous growth and residual cover are important in the understory.

Greater sage-grouse have specific habitat requirements to carry out their life cycle functions. Early spring habitats or breeding sites called "leks" are usually situated on ridge tops or grassy areas surrounded by a substantial brush and herbaceous component (USDOI BLM 2012b). Leks have less herbaceous and shrub cover than the surrounding areas. In early spring, males gather in leks where they strut to attract females. Nests are located in thick cover in sagebrush habitat and consist of a shallow depression on the ground. Habitat for brood-rearing in early spring is critical to brood survival. Important habitat components for brood rearing include a sagebrush overstory, an herbaceous understory, and the presence of plentiful insects, especially wasps, bees, ants and beetles, which provide a high-protein diet for broods. Insects are especially important in the diet of newly hatched broods. Over the fall, birds shift from consuming large amounts of forbs to eating mostly sagebrush. Access to sagebrush for food and cover in winter is critical to their survival.

Greater sage-grouse habitat is found over most of the 3 Bars Project area. The distribution of Greater sage-grouse on the project area is closely tied to the sagebrush ecosystem that provides nesting, brood-rearing, and fall/winter cover as well as forage throughout the year. Summer habitat consists of sagebrush mixed with areas of wet meadows, riparian, and irrigated agricultural fields. Fall habitat consists of a mosaic of low-growing sagebrush and Wyoming big sagebrush. Winter habitat is contingent on the severity of winter weather, topography, and vegetative cover, but access to sagebrush for food and cover in winter is critical to Greater sage-grouse survival.

Late spring habitat and nesting sites are in thick cover in sagebrush habitat beneath sagebrush or other shrubs. Individual Greater sage-grouse move seasonally between habitat types throughout the year (USDOI BLM 2012b). With the exception of a few of the higher elevation areas, all of the 3 Bars project area is within the summer distribution range for Greater sage-grouse. Nearly all of the foothills and lowland areas are within the winter range of the species, and Kobeh Valley and Denay Valley are within nesting range.

The NDOW defines lek status as active, inactive, historic, or unknown. An active lek is defined as a lek that had two or more birds present during at least one of three or more surveys in a given breeding season. For a strutting ground to attain this status, it must also have had two or more birds present during at least 2 years in a 5-year period. An inactive lek is a lek that has been surveyed three or more times during one breeding season with no birds detected during the surveys and no sign observed on the lek. If a lek is only surveyed once during a breeding season and was surveyed under adequate conditions and no birds were observed at the location during the current and the previous year and no sign was observed at the lek, then an inactive status can be applied to the lek. An unknown lek is a lek that may not have had birds present during the last survey, but could be considered viable due to the presence of sign at the lek. This designation could be especially useful when weather conditions or observer arrival at a lek could be considered unsuitable to observe strutting behavior. The presence of a single strutting male would invoke the classification of the lek as unknown. A lek that was active in the previous year, but was inadequately sampled (as stated above) in the current year with no birds observed could also be classified as unknown. An historic lek is a lek that has not had bird activity for 20 years or more and has been checked according to protocol at least intermittently. Another means of classifying a lek as historic is to photograph a lek location and determine if the habitat is suitable for normal courtship displays. For example, if a lek location lies in a monotypic stand of sagebrush that is 3 to 4 feet tall, then conditions are no longer suitable for leking activity.

The BLM and Forest Service have developed a National Greater Sage-Grouse Planning Strategy for identifying important Greater sage-grouse habitat. Currently, agencies are utilizing habitat classifications addressed in the

ARMPA to guide land use decisions— Priority Habitat Management Areas (PHMA), General Habitat Management Areas (GHMA) and Other Habitat Management Areas (OHMA). Priority Habitat Management Areas and General Habitat Management Areas indicate where land-use changes could result in an expected negative impact to sage-grouse population health and are shown on **Figure 3-42** for the 3 Bars Project area. These classifications are a conglomeration of NDOW Greater seasonal sage-grouse data.

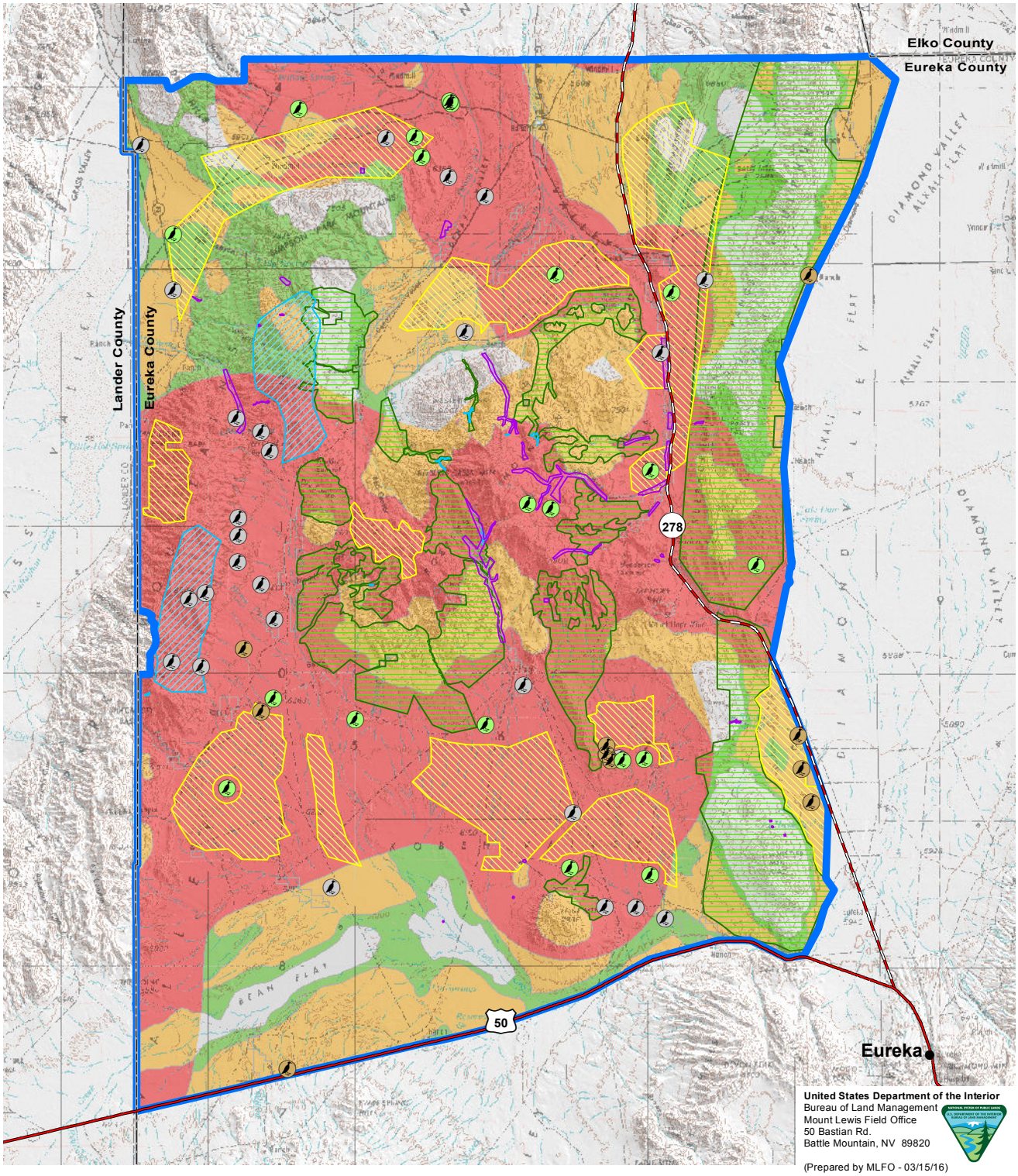
Priority Habitat Management Areas consist of essential, irreplaceable and important habitats for Greater sage-grouse. These areas include breeding habitat (lek sites and nesting habitat), brood-rearing habitat, winter range, and important movement corridors. Priority Habitat Management Areas primarily consists of sagebrush, but may also include riparian communities, perennial grasslands, agricultural land, and restored habitat, including recovering burned areas. The BLM and the Forest Service define PHMA as having the highest conservation value to maintaining sustainable Greater sage-grouse populations.

General Habitat Management Areas consist of habitat types of moderate importance to Greater sage-grouse, however, GHMA may also include areas of higher quality habitat that lacks bird survey and inventory data to support a priority habitat ranking. General Habitat Management Areas provides some benefit to Greater sage-grouse populations but, in many instances, lacks a key component, such as adequate shrub height or density or sufficient herbaceous understory, which prevents it from meeting its full ecological potential. General Habitat Management Areas also may include areas burned recently that have not sufficiently recovered or sagebrush communities with pinyon-juniper encroachment. The BLM and the Forest Service define GHMA as lands where some special management will apply to sustain Greater sage-grouse populations. General Habitat Management Areas have the potential to be reclassified as Priority Habitat Management Areas if restoration efforts enhance the habitat quality or ongoing field efforts document Greater sage-grouse use.

Other Habitat Management Areas consist of lands identified as unmapped Greater sage-grouse habitat that are within the planning area and contain seasonal or connectivity habitats.

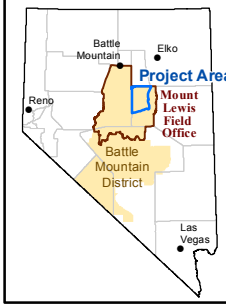
The Greater sage-grouse population trends are tracked based on the number of males per lek (Sage- and Columbian Sharp-Tailed Grouse Technical Committee 2008). Individual Greater sage-grouse counts can vary year to year and approximately 10 years of data are required to establish population trends. Populations in Eureka County showed a 25 percent increase between 2011 and 2012, but are only 55 percent of the highest recorded levels in 1986. The peak male attendance at ten comparable leks surveyed in 2012 was 259, for an average of 25.9 males per lek. In 2011, 207 males were counted for an average of 20.7 males per lek. The average in 2006 was 41 males, which is the highest average since the 1986 average of 47 males. In addition to trend counts there were additional leks monitored by the NDOW, BLM, and University of Nevada-Reno graduate students in 2012. The 18 leks monitored in 2012 had 346 males in attendance for an average of 19.2 males per lek. In 2011, these same leks had 307 males yielding an average of 17.1 males per lek for a 12 percent increase from 2011 to 2012. Within the 3 Bars project area, there were 21 active leks surveyed in 2012; 339 males were counted, for an average of 16.1 males per lek. An additional 27 leks have a status of unknown, and there are 10 historic lek sites (**Figure 3-42**; Podborny 2012).

Habitat for Greater sage-grouse over much of the 3 Bars Project Area is in decline, and proposed treatments are designed to slow or reverse this trend (**Figure 3-40**). The most significant threats to Greater sage-grouse in Nevada are natural system modifications due to wildfire and the subsequent loss of habitat as well as impacts of invasive species (cheatgrass) and pinyon-juniper encroachment. Other threats include habitat fragmentation and disturbance, particularly roads and utility service lines as a result of both renewable and non-renewable energy resources, and degradation caused by overgrazing, mining, and recreational activities.



United States Department of the Interior
Bureau of Land Management
Mount Lewis Field Office
50 Bastian Rd.
Battle Mountain, NV 89820

(Prepared by MLFO - 03/15/16)



Legend

Greater Sage-grouse Leks and Habitat

- Active Lek
- Historic Lek
- Unknown Lek Status
- Priority Habitat Management Area
- Other Habitat Management Area
- General Habitat Management Area
- Non-Habitat
- Pinyon-juniper Treatment Area
- Sage Treatment Area
- Aspen Treatment Area
- Riparian Treatment Area
- 3 Bars Project Area

Source: BLM 2012f,k.

3 Bars Ecosystem and Landscape Restoration Project

Figure 3-42

Greater Sage-grouse Leks and Habitat

0 1 2 3 4 5 10 Miles

0 1 2 3 4 5 10 Kilometers

N

Bald Eagles

Bald eagles are found throughout Nevada as part of the species winter range and are known to occur within the project area, with most occurrences along the northeastern edge of the project area boundary. Bald eagles roost preferentially in large conifers or other sheltered sites in winter and typically select the larger, more accessible trees. There are no known bald eagle nesting sites within the project area (NDOW 2009c).

Golden Eagle

Golden eagles are found throughout Nevada and the project area. Golden eagles are generally found in a variety of open to semi-open landscapes, especially in hilly or mountainous regions, and avoid heavily forested areas. This species typically nests on rock ledge on cliffs or occasionally in large trees. Pairs may have several nests, and may use the same nest in consecutive years or shift to using an alternate nest in different years. Nests have been recently found in the project area (USDOI BLM 2012b). Golden eagles feed mainly on small mammals (e.g., rabbits, marmots, ground squirrels), although they are opportunistic and may also eat insects, snakes, birds, young deer or pronghorn antelope, and carrion.

Northern Goshawk

Northern goshawks breed and winter throughout the state. Northern goshawks rely on open sagebrush adjacent to riparian and aspen stands for foraging, and aspens are a key habitat feature. Nests are generally constructed in the largest trees in dense, large tracts of mature or old growth aspen stands with high canopy closure (60 to 95 percent) and sparse ground cover, near the bottom of moderate slopes, and near water or dry openings. Prey items include tree squirrels, ground squirrels, rabbits, and various bird species, depending on availability. Within the project area, northern goshawks are known from aspen and riparian habitat in the west-central Roberts Mountains (NDOW 2009c).

Peregrine Falcon

Peregrine falcons use various open environments including steppe, over open water, and desert shrub habitats including sagebrush, usually in close association with suitable nesting cliffs. They can also be found in mountainous, open forested regions, and human population centers. Peregrine falcons often nest on ledges or in holes on rocky cliff faces, commonly in sites sheltered by an overhang. There is an historic NDOW record for peregrine falcons in the Roberts Mountains (NDOW 2009c). Peregrine falcons feed primarily on birds, ranging in size from medium songbirds up to small waterfowl. They may also hunt small mammals, such as bats, or lizards, fishes, and insects.

Swainson's Hawk

Swainson's hawks are a spring and summer resident of Nevada, including the project area. Open riparian woodlands, including aspen woodlands, with significant expanses of pasture, agricultural fields, wet meadow, or open shrublands with grass cover in the immediate vicinity, provide an ideal landscape for the Swainson's hawk. The preferred nesting site is in large riparian trees. Small mammals are typical prey (Great Basin Bird Observatory 2010).

Ferruginous Hawk

Ferruginous hawks are year-round and breeding residents in central Nevada, including the 3 Bars Project area. Habitat includes open country, sagebrush, saltbush-greasewood shrubland, and the periphery of pinyon-juniper and other woodland and desert communities. In Nevada, ferruginous hawks nest primarily in live juniper trees. Mammals are

the primary prey during the breeding season, although birds, amphibians, reptiles, and insects are also taken. Ferruginous hawk sightings in the 3 Bars Project area have occurred around the perimeter of the project area in relatively level, open terrain. There are over 50 records for nesting sites within the project area, although only one of these, in the southeastern corner of the project area, has been observed active within the past 10 years (NDOW 2009c). Small mammals are the primary prey during the breeding season, although birds, amphibians, reptiles, and insects also are taken.

Western Burrowing Owl

Western burrowing owls are mostly migratory in northern Nevada, although some individuals may overwinter. Preferred habitat is characterized by short vegetation and the presence of fresh small mammal burrows, indicating an abundance of the deer mice and meadow voles that are preferred food. Western burrowing owls typically nest and roost in burrows abandoned by grounds squirrels, badgers, fox, and tortoise, although they occasionally excavate fresh burrows (Wildlife Action Plan Team 2006).

Within the project area, there are records for western burrowing owl from the open lands surrounding the Roberts Mountains. The most recent record is for two owls sighted at a burrow in 2006, in the southwestern quadrant of the project area. (NDOW 2009c).

Yellow-billed Cuckoo

The yellow-billed cuckoo is listed as threatened, under the Endangered Species Act. Historically, the species was found state-wide areas of large, contiguous, densely wooded cottonwood-willow riparian habitat. The species nests in willows and forages for large insects, its primary food source, in cottonwood trees. The last sighting of yellow-billed cuckoo in or near the project area was in 1976, just outside of the southeast corner of the project area boundary (Nevada Natural Heritage Program 2006).

Lewis' Woodpecker

Lewis' woodpeckers are a year-round resident within the project area. Important habitat features include an open tree canopy, a brushy understory with ground cover, dead trees for nest cavities, dead or downed woody debris, perching sites, and abundant insects. In Nevada, this species is most strongly associated with deciduous riparian woodlands dominated by aspen or cottonwood (Great Basin Bird Observatory 2010). The species is a weak excavator, and as such it is dependent on dead trees, and tends to nest in existing tree cavities. Key habitat factors include the presence of large, partly decayed snags, an open forest structure for aerial foraging, and a well-developed shrub or native herbaceous layer that promotes healthy populations of flying insects.

Lewis' woodpeckers feed on insects including ants, beetles, flies, grasshoppers, tent caterpillars, and mayflies during the summer, and ripe fruit and nuts in the fall and winter. Unlike other woodpeckers, Lewis' woodpeckers do not bore for insects, but will catch them in flight, glean insects from tree branches or trunks, and forage on the ground. Lewis' woodpeckers are suspected, but not documented, within the project area (Great Basin Bird Observatory 2010).

Loggerhead Shrike

Loggerhead shrikes are a year-round resident throughout the state. This species breeds in open country with scattered trees and shrubs, savanna, desert scrub, and, occasionally in open woodlands. Loggerhead shrikes often perch on

poles, wires, or fence posts and suitable hunting perches are an important part of the habitat. Nesting habitat includes shrubs and small trees, including cholla cactus and sagebrush.

Loggerhead shrike feed primarily on large insects, small birds, lizards, frogs, and rodents, and will occasionally scavenge. While there are no records for loggerhead shrike within the project area, there are occurrence records near the southeastern edge of the project area.

Sage Thrasher

Sage thrashers occupy the Great Basin region of Nevada including the project area. Sage thrashers breed and forage in sagebrush, juniper, mountain mahogany, and aspen communities, and have a preference for patchy habitat with adequate shrub cover. The species occasionally nests on the ground but more typically nests in low shrubs, typically sagebrush. Sage thrashers feed on a wide variety of insects, including grasshoppers, beetles, weevils, ants, and bees, as well as fruits and berries. There are extant sage thrasher records for the southeastern corner of the project area (Great Basin Bird Observatory 2010).

Black Rosy-finch

Black rosy-finches winter in central Nevada, including the project area (Ellsworth 2013). This species uses barren, rocky, or grassy areas and cliffs among glaciers or beyond timberline as habitat. During migration and winter this species also occurs in open fields, cultivated lands, brushy areas, and around human habitation. Black rosy-finches usually nest in rock crevices or in holes in cliffs above snow fields, although it may nest in old abandoned buildings, mine shafts, or other protected sites. The black rosy-finch forages on the ground for seeds. In the spring, it gleans wind-blown insects from the snow, and later in the season it may glean insects from vegetation or may chase flying insects and catch them in the air.

Brewer's Sparrow

Brewer's sparrows breed in northern Nevada, including the project area, but does not overwinter in the project area. The species is strongly associated with healthy sagebrush habitats, and prefers areas with patchy cover by scattered tall shrubs and short grasses. Brewer's sparrows can be found to lesser extent in mountain mahogany and rabbitbrush habitats, bunchgrass grasslands with shrubs, bitterbrush, ceanothus, and manzanita, and in large openings in pinyon-juniper stands. Sagebrush is the preferred nesting habitat.

Brewer's sparrows are primarily a ground forager. During the summer they eat a variety of insects, and in the fall and winter transitions to a diet of seeds. Brewer's sparrow nest in sagebrush throughout the 3 Bars Project area (Ellsworth 2013).

Pinyon Jay

Pinyon jays are a year-round resident anywhere in Nevada where pinyon pine occurs, including appropriate habitats in the project area. Pinyon jays have a strong preference for pinyon-juniper woodlands, and occur less frequently in pine habitats. During the non-breeding season, this species may also occur in scrub oak and sagebrush. Pinyon jays nest in shrubs or trees when adequate numbers of pine seeds are available. The pinyon jay diet consists of pinyon nuts and other pine seeds, berries, small seeds, and grain, as well as insects including beetles, grasshoppers, caterpillars, and ants. Pinyon jays may also eat bird eggs and hatchlings. Pinyon jays have been observed on Roberts Mountains and Sulphur Spring Range (Ellsworth 2013).

Mammals

Dark Kangaroo Mouse

The dark kangaroo mouse inhabits stabilized dunes and other sandy soils in valley bottoms and alluvial fans dominated by big sagebrush, rabbitbrush, and horsebrush. These nocturnal rodents typically occur in sandy habitats below the elevation where pinyon-juniper occur and above elevations where greasewood and saltbush predominate. Although restricted to sand, it displays a broad tolerance for soils with varying amounts of gravel. Seeds are the primary food source although it will also eat some insects. It does not appear to use free-standing water and probably gets moisture from its food sources. It is believed to store food in seed caches within the burrow system.

There is one extant record for dark kangaroo mouse within the project area. This record is from 2005, in the southeast Kobeh Valley near Whistler Mountain (NDOW 2008a). The potential range of the species includes appropriate habitat throughout the project area.

Pygmy Rabbit

The pygmy rabbit is a diminutive native species that is found primarily on plains dominated by big sagebrush and on alluvial fans where plants occur in tall, dense clumps. Deep, loose soils are required for burrow excavation, although they will occasionally occupy burrows dug by other animals in harder soils. Big sagebrush is the primary food and may comprise up to 99 percent of food taken in winter and 51 percent in the summer. Wheatgrass and bluegrass are highly preferred foods in the summer. Cheatgrass invasion is detrimental to pygmy rabbits. Shrub cover is necessary for protection during dispersal and cheatgrass monocultures may provide a barrier to dispersal. Pinyon-juniper encroachment decreases understory species and, in turn, decreases suitable pygmy rabbit habitat. Pygmy rabbits spend the majority of their lives within 40 feet of their burrows (Utah Division of Wildlife Resources 2003), although occasionally males will venture more than 2 miles during the breeding season (Katzner and Parker 1998).

Pygmy rabbits are found in several locations in the project area, including along the east side of the Kobeh Valley, several locations along riparian systems in the central and southern portion of Roberts Mountains, and in the Parks Mountains north of Cottonwood Canyon. Surveys conducted in the southeast portion of the project area as part of the Mount Hope Project EIS found 19 burrows and 10 pygmy rabbits. The majority of the sightings and burrows were along the old railroad grade to the west of and paralleling State Route 278, and numerous sightings and burrow complexes were also along the alluvial fan east of Mount Hope Spring (NDOW 2009c, e, USDOI BLM 2012b).

California Myotis

The California myotis is found throughout Nevada, primarily at elevations below 6,000 feet amsl. The species is somewhat of a habitat generalist, and is found in habitats ranging from desert scrub to forested areas. This bat roosts in crevices, including those found in mines, caves, buildings, rocks, hollow trees, and under bark. California myotis forages in the open for a variety of small insects such as moths, flies, and beetles. Most records for the species are from southern Nevada, but the species has the potential to occur in the project area (NDOW 2008a).

Fringed Myotis

The fringed myotis is found throughout central and southern Nevada in a wide range of appropriate habitat, from low desert scrub to high elevation coniferous forests, including white fir forests and pinyon-juniper woodlands. This species roosts in mines, caves, trees, and buildings, and may also use rock crevices, tree hollows, and rock crevices in

cliff faces. Nurseries and hibernacula are generally mines or caves. Foraging occurs in and among vegetation, with some gleaning activity. In some areas, there is evidence that fringed myotis use forest edges as well as areas above the forest canopy for foraging. The fringed myotis eats a variety of insects but seems to preferentially select beetles. There are no records for fringed myotis within the project area (NDOW 2008a).

Hoary Bat

The hoary bat is a tree-roosting species, found primarily in forested/woodland upland habitats such as pinyon-juniper and conifers, as well as in gallery forest riparian zones. Hoary bats day roost 10 to 18 feet above ground in trees that offer good protective leaf cover, but that are open below to facilitate flying in and out of the roost. Hoary bats may migrate for the winter or hibernate on tree trunks, in a tree cavity, or in a squirrel's nest. Food items include a variety of insects but moths, dragonflies, and beetles feature prominently. Foraging is generally over the tree canopy. In the open, rapid descending arcs are exhibited. Hoary bats will follow watercourses for foraging and drinking. The nearest records for hoary bat are southwest of the project area although their range includes the project area (NDOW 2008a).

Little Brown Bat

The little brown bat is found primarily at higher elevations, and is often associated with coniferous forest and with larger bodies of water or rivers. Often, roost sites are associated with these aquatic features. Little brown bats have adapted to using human-made structures for resting and maternity sites, but will also use caves, hollow trees, and rock outcrops. These bats feed heavily on aquatic insects such as caddisflies, midges, and mayflies, although a variety of other terrestrial insects may be eaten. Foraging occurs in open areas among vegetation, along water margins, and sometimes a few feet above the water surface.

In the eastern U.S., little brown bats suffer from white-nose syndrome, with over 5 percent mortality in some areas, Should the disease spread to the west, white nose syndrome would be a significant threat to the overall viability of the species. Little brown bat is more common in the northern part of Nevada. There are no records for little brown bat in the project area (NDOW 2008a).

Long-eared Myotis

The long-eared myotis is usually associated with coniferous forests. Individuals roost under exfoliating tree bark, and in hollow trees, and occasionally in caves, mines, cliff crevices, sink-holes, and rocky outcrops on the ground. It is often described as a hovering gleaner that feeds by eating prey off foliage, tree trunks, rocks, and from the ground. The species is found throughout the state and its range includes the project area; there are species records for long-eared myotis in the Roberts Mountains (NDOW 2008a).

Long-legged Myotis

The long-legged myotis is found in pinyon-juniper woodland and montane coniferous forest habitats, and is occasionally found in salt desert scrub, blackbrush, mountain shrub, and sagebrush habitats. This species roosts primarily in hollow trees, particularly large-diameter snags or live trees with lightning scars, and may use rock crevices, caves, mines, and buildings when available. Long-legged myotis feeds primarily on moths, but also feeds on beetles, flies, and termites.

The species is found throughout the state and its range includes the project area. There are no species records for long-legged myotis in the project area (NDOW 2008a).

Silver-haired Bat

The silver-haired bat is a forest-associated species and is more commonly found in mature forests. These bats are found primarily at higher latitudes and altitudes in coniferous and mixed deciduous and coniferous forests/woodlands of pinyon-juniper, limber pine, aspen, cottonwood, and, willow. These bats forage for a wide variety of insects above the forest canopy or along wooded edges, roadsides, and the edges of streams and waterbodies. Moths appear to be a major portion of their diet. Loss of foraging habitat in riparian zones is a threat.

The species is found throughout the state and its range includes the project area. There are no species records for silver-haired bats in the project area (NDOW 2008a).

Townsend's Big-eared Bat

The Townsend's big-eared bat roosts in mines, caves, and cave-like spaces in pinyon, curl-leaf mountain mahogany, blackbrush, sagebrush, salt desert scrub, agricultural, and occasionally urban habitats. Foraging associations include the edge of habitats along streams that are adjacent to and within a variety of wooded habitats. Townsend's big-eared bats are moth specialists, with nearly all of their diet consisting of moths.

The species' range includes the entire state including the project area. The nearest records to the project area for Townsend's big-eared bat are immediately north and northwest of the project area and southeast of the project area (NDOW 2008a).

Western Pipistrelle

The western pipistrelle can be found in Sonoran desert habitats of blackbrush, creosote, salt desert shrub, and sagebrush, with occasional occurrence in pinyon-juniper woodlands, usually in association with rock features such as granite boulders and canyons. The species typically roosts in rock crevices, but may use mines, or, less frequently, buildings and vegetation. Food includes small moths, leafhoppers, mosquitoes, and flying ants. Foraging occurs in the open.

The species is found throughout most of the state, primarily in the southern and western portions. The species has the potential to occur in the project area although there are no records for western pipistrelle in the project area (NDOW 2008a).

Western Small-footed Myotis

The western small-footed myotis is found in a variety of habitats including desert scrub, grasslands, sagebrush steppe, blackbrush, greasewood, pinyon-juniper woodlands, pine-fir forests, agricultural, and urban areas. This species is a crevice rooster and uses mines, caves, buildings, rock crevices, hollow trees, and exfoliating bark on trees. Western small-footed myotis forages early in the evening on a variety of insects including small moths, flies, ants, and beetles that occur in open areas.

The species is found throughout Nevada except for the far southeastern corner of the state. The species has been observed near the southeast corner of the project area (NDOW 2008a).

3.16.3 Environmental Consequences

3.16.3.1 Key Issues of Concern Considered during Evaluation of the Environmental Consequences

Based on the AECC and public scoping comments, a number of concerns specific to wildlife and 3 Bars ecosystem restoration were identified and are discussed in this section. These include:

- Reduction in the amount of key wildlife habitat because of degraded range conditions due to past rangeland management practices and past range disturbances.
- Project actions could have large-scale effects ranging from increased sedimentation of streams to major fragmentation of pinyon jay, Virginia's warbler, Greater sage-grouse, Brewer's sparrow, and other sensitive species' habitat.
- Encroachment and expansion of pinyon-juniper into important habitat for Greater sage-grouse or other wildlife species.
- Proposed treatments in pinyon pine woodlands and any resulting impacts to pine nuts could impact several species of birds and mammals, including pinyon jay and mule deer.
- There is a need to thin pinyon-juniper along drainages to improve water flows in streams and to open up corridors for animal movement on the south and east side of drainages.
- There is a need to assess treatment impacts on wildlife species that are dependent on old growth pinyon-juniper as well as on other species that may nest in the area or migrate through it.
- There is a need to assess how sagebrush treatments would impact habitat for pygmy rabbit, sage sparrow, and other sagebrush species.
- The potential to fragment remaining patches of sagebrush by mowing and chopping could hasten the decline of the Greater sage-grouse population.
- That all factors affecting Greater sage-grouse (including predators and hunters) be considered, not just loss of habitat.
- Need to address movements of Greater sage-grouse hens with broods from valley nesting and early brood rearing sites to upper elevation sagebrush and riparian communities on Roberts Mountains.
- Thinning of the pinyon-juniper woodlands along creek bottoms may be beneficial to the survival of Greater sage-grouse.
- The effects of invasion of undesirable plant species into Greater sage-grouse and other wildlife habitats.
- The high, very high, or extreme risk of catastrophic wildfire in important Greater sage-grouse habitats.
- Fences can cause avian mortality from collisions, including significant Greater sage-grouse mortality, and can serve as perches for predators or observation posts for the brown-headed cowbird.
- Proper size, shape, and design of vegetation treatments to create an edge effect would be critical in the success of the project for wildlife.

- Whether Greater sage-grouse, pygmy rabbit, pinyon jay, loggerhead shrike, and other species in the 3 Bars ecosystem are present at levels that provide viable populations in the short-, mid-, and long-term, especially under continued livestock degradation of habitats, utility corridor developments, mining and energy developments, and the spread of cheatgrass and noxious weeds and other invasive non-native vegetation that would be promoted by the various vegetation and woodland removal plans the BLM may be contemplating.
- Whether there is an opportunity for the reintroduction of bighorn sheep into the 3 Bars ecosystem if domestic sheep operations voluntarily relinquish their permits, a change of livestock occurs, or further research is conducted into bighorn sheep diseases.

3.16.3.2 Significance Criteria

Impacts to wildlife would be considered significant if BLM actions resulted in:

- A substantial, long-term (greater than 10 years) reduction in the quantity or quality of habitat critical to the survival of local populations of common wildlife species.
- Injury or mortality to common wildlife species, such that species populations would not recover within 5 years.
- Mortality to a listed species or species proposed for listing that could result in a "take" under the Endangered Species Act.
- A reduction in the population, habitat, or viability of a species of concern or sensitive species that would result in a trend toward endangerment or the need for federal listing.
- Any loss of birds, eggs, or nesting habitat critical to migratory birds under the Migratory Bird Treaty Act, in the project area.

3.16.3.3 Direct and Indirect Effects

3.16.3.3.1 Direct and Indirect Effects Common to All Action Alternatives

Adverse Impacts

Adverse effects to wildlife common to all treatments include injury and loss of life, noise and other disruptions associated with treatment applications, and temporary and long-term habitat effects.

The use of vehicles and treatment equipment for restoration poses a risk of injury or death by crushing animals or their nests or roosts, and vehicle weight may collapse burrows or compact soils. Soil compaction may also make burrow or den excavation difficult. Fuel spills could have negative effects to wildlife species on land if fuel is ingested, and could negatively impact water quality. The likelihood of such an impact is negligible, though, as refueling would generally occur off-site or away from treatment areas.

Hand-held manual equipment, including chainsaws, mechanical equipment, and transport vehicles create noise that can disturb animals and cause them to flee or alter their behavior or habitat use. Most researchers agree that noise can affect an animal's physiology and behavior, and if it becomes a chronic stress, noise can be injurious to an animal's energy budget, reproductive success, and long-term survival (Radle 2007). The loudness of normal conversation is about 65 decibels, while the loudness of a chainsaw is about 110 decibels. These effects would be short-term and

occur within a relatively small area, however, and would not likely to have much effect on the long-term health and habitat use of wildlife in the treatment area.

Over the short-term, treatments could make habitats less suitable for some wildlife species, requiring displaced wildlife to find suitable habitat elsewhere. If these habitats were already near or at capacity in the number of wildlife they could support, displaced animals might perish or suffer lower productivity. In many cases, the treatments would return all or a portion of the treated area to an early successional stage, favoring early successional wildlife species. In areas where fire suppression has historically occurred, vegetation treatments could benefit native plant communities by mimicking a natural disturbance component that has been missing from these communities. Treatments would also restore native vegetation in areas where noxious weeds and other invasive non-native vegetation have displaced native plant species. Wildlife that occurred historically in these areas would likely increase in numbers, while species that have adapted to the disturbed conditions, such as chukar partridge, would decline (USDOI BLM 2007c:4-75).

Species that are mobile or that are not dependent on a specific habitat type can relocate during treatment activities and adapt to a new environment. Species that require very specific habitat conditions or that cannot relocate easily may be more vulnerable to impacts. Treatments that cover a large area have more potential to affect species, because there may be less opportunity for an animal in the interior of a treatment area to vacate, and because the number of individual animals affected is likely to be greater for a large area (USDOI BLM 2007c:4-74).

Small, temporary exclosure fencing would be used to protect treatment sites. Although fencing would benefit wildlife habitat, it can also modify wildlife movements and wildlife may collide with fences. Stevens (2011) found that sage-grouse collisions with fences were fairly common in Idaho, especially in areas near leks.

Beneficial Impacts

Proposed treatments would occur across the 3 Bars Project landscape, would target areas with declining habitat quantity and quality, and would facilitate wildlife movement across the landscape. There has been a loss of habitat diversity and complexity due to pinyon-juniper encroachment into riparian, woodland, and sagebrush habitats, and decrease in the abundance and diversity of animals that can be supported in areas with pinyon-juniper encroachment. Loss of habitat at the landscape level would be addressed by reducing levels of pinyon-juniper encroachment into other habitats, reducing the spread of noxious weeds and other invasive non-native vegetation, and reducing the risk of catastrophic wildfire. Treatments that slow or reverse pinyon-juniper encroachment and promote the development of native vegetation would improve habitat structure and species composition (USDOI BLM 2007c:4-85).

Cheatgrass and other noxious weeds and other invasive non-native plants provide few wildlife benefits, often occur in monocultures across the landscape, and alter wildfire cycles to the detriment of native vegetation and wildlife. By slowing or reversing the spread and occurrence of noxious weeds and other invasive non-native vegetation on the landscape, greater numbers and types of wildlife would be supported by the area, and risks to special status species and other species found in low numbers in treated ecosystems would be reduced.

Treatments that reduce hazardous fuel loads, slow the spread of pinyon-juniper, reduce woodland densities, reduce the incidence of disease within pinyon-juniper communities, reduce the spread of noxious weeds and other invasive non-native vegetation, and create fuel and fire breaks would reduce the risk of catastrophic wildfire harming wildlife or their habitat (Connelly 2013). Fire and fuel breaks would be designed in collaboration with NDOW to minimize the loss of sagebrush in key habitats. Treatments aimed at restoring natural fire cycles would improve vegetation resilience and increase plant diversity across the landscape, to the benefit of wildlife (USDOI BLM 2007c:4-85).

Improvements in habitat quality would increase the carrying capacity of the landscape and allow it to support larger and healthier wildlife populations. In particular, treatments would benefit mule deer, pronghorn antelope, and Greater sage-grouse by removing pinyon-juniper that reduces habitat quality or thinning vegetation (pinyon-juniper) to allow more desirable vegetation, such as forbs and grasses, to better compete and thrive. Thinning and removing pinyon-juniper would also benefit local and seasonal movements of wildlife, including mule deer and Greater sage-grouse. The BLM would not thin or remove sagebrush in Greater sage-grouse wintering and breeding areas, as recommended by Connelly (2013). Removing pinyon-juniper could benefit Greater sage-grouse because they are thought to avoid trees and other tall vegetation during migration and local movements. Because water is scarce on the 3 Bars Project area, the BLM would implement stream and riparian restoration projects to improve water availability for wildlife. In addition, slash piles left from thinning pinyon-juniper would be used provide microhabitat and cover for reptiles, rabbits and other small mammals, and songbirds.

Wildfire, spread of invasive plants, and other factors have caused habitat fragmentation and the loss of connectivity between blocks of habitat, especially in lower elevation riparian zones, woodlands, and sagebrush. Fragmentation has isolated some animal populations and reduced the ability of populations to disperse across the landscape by increasing the distance that wildlife must travel between suitable habitat patches. Treatments that restore native vegetation in disturbed areas should reduce fragmentation and restore connectivity among blocks of similar habitat, allowing wildlife to move more easily across the landscape (USDOI BLM 2007c:4-85).

3.16.3.3.2 Direct and Indirect Effects under Alternative A (Preferred Alternative)

Because of the increase in the amount of habitat treated, both short-term impacts and long-term benefits to wildlife would be greatest under this alternative. Species would benefit through the slowing of pinyon-juniper encroachment; removal of crested wheatgrass, forage kochia, and cheatgrass; creation of a matrix of habitat types; reseeding and replanting of native shrubs, forbs, and grasses to restore habitat; a reduction in the threat of a catastrophic wildfire; and increase in edge habitat. Species that would benefit from edge habitat would include Greater sage-grouse that might forage in meadows and near streams, but seek shrub cover for shelter; raptors that perch in pinyon-juniper trees but forage in adjacent grassland and sagebrush habitats; and mule deer that forage in meadows, but seek shelter and thermal cover in adjacent pinyon-juniper woodlands.

Riparian Treatments

Adverse Effects

Treatment activities may result in a permanent or temporary loss of cover along riparian zones, potentially exposing animals to predators and causing the loss of thermal cover during temperature extremes. Loss of wooded areas adjacent to streams may make the habitat unsuitable for species that prefer wooded riparian zones.

Treatment work at several streams, ponds, wells, and springs would involve using heavy equipment to reconstruct streams and improve riparian habitat. Heavy equipment and placement of rock and other structures in streams pose a risk of injury or death by crushing animals or their breeding sites; amphibians would be most susceptible to harm or injury from use of heavy equipment near streams. If not done properly, stream reconstruction could worsen stream channel morphology, alter water depths and flows, and cause the loss of additional riparian habitat. Changes in water availability and flow rates would be especially harmful to amphibians that lay their eggs in water and require relatively stable water conditions for their eggs and hatchlets. Loss of riparian vegetation would contribute to

sedimentation via increased runoff and erosion, affecting in-stream habitat for aquatic species including amphibians that forage, breed, or hide in stream gravel or spaces between stones (Pilliod et al. 2003).

Manual and mechanical methods would be used at Hash Spring and several other springs, as well as at sites where Lahontan cutthroat trout habitat improvements are planned. About half of the pinyon-juniper treatments would occur in Phase I stands, and the remaining treatments would be split nearly evenly between Phase II and III stands. Most of the Phase II and III treatments would occur along Roberts Creek. This would reduce the amount of habitat available to pinyon-juniper dependent species, including pinyon jay, gray flycatcher, juniper titmouse, Bewick's wrens, blue-gray gnatcatchers, black-throated gray warblers, and ferruginous hawks (Miller et al. 2005). Removal of Phase III trees and decayed and malformed trees could eliminate habit for cavity-nesting birds, such as woodpeckers and owls, and nesting and roosting habitat for small mammals, such as bats, squirrels, and mice. Removal of pinyon-juniper, particularly large trees, would also reduce the capacity of woodlands to intercept snow and provide snow-intercept thermal cover during winter (Hunter 1990 *cited in* USDOI BLM 2007c). Loss of winter cover may negatively affect mule deer that use pinyon-juniper areas during the winter (Miller et al. 2005). Fire and fuel breaks could serve as a barrier to small mammal and amphibian movement.

Small, temporary exclosure fences erected at riparian treatment sites could have an adverse effect on some small mammals, birds, and reptile populations because fences may provide perches for raptors and ravens that predate on small mammals such as mice, bats, and squirrels. Fences could also provide scanning perches for brown-headed cowbirds, thereby helping them to locate and parasitize bird nests and small mammals, such as bats, squirrels, and mice.

Beneficial Effects

Riparian treatments are designed to enhance water quality and quantity for wildlife, while also promoting improved habitat conditions that lead to higher quality forage and cover. Approximately 85 percent of riparian treatment acreage is within mule deer summer or winter range habitat, while over 80 percent of the riparian treatment acreage is within the summer or winter range for Greater sage-grouse (**Figures 3-39** and **3-42**; NDOW 2008a, 2009d). Proposed treatments would focus on restoring degraded riparian habitat, including restoring about 1,250 acres of mule deer habitat, 177 acres of pronghorn antelope habitat, and 2,093 acres of Greater sage-grouse PHMA.

A key feature of healthy riparian habitat is a high diversity of microhabitats. However, riparian habitat systems on the 3 Bars Project area have been altered through actions such as stream channelization, construction of water diversions for livestock, construction of roads, introduction of noxious weeds and other invasive non-native vegetation, and pinyon-juniper encroachment. For many wildlife species, these alterations often mean a loss of habitat (Tsukamoto 1983, Wasley 2004, Wildlife Action Plan Team 2012).

Manual and mechanical treatments are often more effective than other treatment methods, especially in sensitive areas, such as wetland and riparian habitat, or near habitats of plant and animal species of concern, where greater control over treatment effects is required or effects to non-target species are a concern (USDOI BLM 2007c:4-88). Stream restoration using manual and mechanical methods would reduce stream erosion and episodes of bank failure, improving both water quality and stream access for wildlife, while fencing and plantings would improve cover, shoreline stability, and wildlife habitat value. Treatments in riparian zones would create wet meadows and meandering streams and reduce water loss associated with stream downcutting; this would benefit amphibians and provide improved forage and habitat for birds and mammals. Riparian zones in rangelands typically produce more edge habitat in a small area than other habitat types. Mule deer spend a disproportionate amount of time in riparian

habitats, including use as fawning habitat (Thomas et al. 1979), and would see an increase in habitat area and quality as a result of treatments. Riparian zones also produce large quantities of insects, which in turn provide food for wildlife, including Greater sage-grouse and bats.

Reducing the cover of pinyon-juniper on up to 900 acres in riparian treatment areas could improve water flows, allow more desirable riparian, woodland, and sage-brush vegetation to thrive, and open up movement corridors for Greater sage-grouse and other wildlife (see review in Miller et al. 2005:35). Use of felled trees in streams to slow water would create pools that provide breeding habitat for amphibians and open-water drinking areas for bats and other wildlife. By mulching or piling trees, cover and thermal habitat would be created that would provide protection and warmth to amphibians, reptiles, birds, and small mammals. Removal of pinyon-juniper should also improve flows in nearby creeks as water uptake by trees is lessened. For example, DeBoodt (2008) found that in areas where all juniper were cut from a watershed in Oregon, that late season spring flow, days of recorded ground flow, and late season soil moisture increased compared to pretreatment conditions.

Greater sage-grouse would benefit from riparian treatments that remove pinyon-juniper within those corridors used by sage-grouse for seasonal movements, and improve habitat quality within brood-rearing areas. Pinyon-juniper treatments within riparian corridors on the Roberts Mountains would be particularly beneficial because dense woodlands likely contribute to a high mortality rate for female Greater sage-grouse and their young as they move from nest sites in the surrounding valleys to higher elevation meadows. It is likely that the removal of pinyon-juniper and regeneration of a riparian and shrub community would facilitate movements and improve Greater sage-grouse survival. Wet meadow and other riparian restoration treatments would increase the availability of insects and other food items needed by Greater sage-grouse chicks and adults. Forbs and insects comprise the bulk of Greater sage-grouse chick diets until they are about 12 weeks old (Crawford et al. 2004), and are important to Greater sage-grouse chick survival (Drut et al. 1994). Atamian et al. (2010) found that Greater sage-grouse and their broods preferred higher elevation, moist sites with riparian shrubs or sagebrush during late brood rearing, and lack of this habitat could be a limiting factor for Greater sage-grouse chick survival (Drut et al. 1994).

Aspen Treatments

Adverse Effects

The primary impact to wildlife from treatments would be from noise, which could cause wildlife to leave the treatment area for a short period of time. There is concern that noise and other disturbance could cause wildlife, including northern goshawk, to abandon nests, however treatment areas would be surveyed for nesting birds prior to treatment and if nests are found, treatments would be delayed until young have fledged.

There also would be loss of pinyon-juniper habitat where trees are felled to slow pinyon-juniper encroachment into aspen stands, and to create fire and fuel breaks. About 10 acres of pinyon-juniper would be treated annually near aspen stands. Effects to wildlife and their habitat from pinyon-juniper removal would be similar to those described under Riparian Management.

Beneficial Effects

Aspen treatments would benefit a variety of wildlife. All of the aspen treatment sites are within mule deer summer or winter range, and 60 percent of the sites are within pronghorn summer or winter range (**Figures 3-39** and **3-41**; NDOW 2008b, 2009d). Of the 151 acres of proposed aspen treatments, about 146 acres are within areas where the

BLM has determined that mule deer habitat is degraded and 88 acres are within degraded pronghorn antelope habitat; treatments could improve habitat conditions for these species (**Figure 3-40**). Lewis' woodpeckers, northern goshawks, and several species of bats are special status species that have been observed using aspen habitats on the 3 Bars Project area. Northern goshawk preferentially use mature aspen communities for nesting, foraging, and roosting, and Lewis's woodpecker and several species of bats use cavities and peeling bark in aspen stands (Wildlife Action Plan Team 2012). Northern goshawk use mature aspen almost exclusively for nesting in the Great Basin (Wildlife Action Plan Team 2012), and their apparent decline in Nevada has been attributed to the loss of mature aspen stands that provide structural support for goshawk nests (Great Basin Bird Observatory 2010). DeByle (1985) noted that stimulation of suckering substantially increased the number of shrub-nesting birds associated with the stand.

Aspen areas provide important habitat for a variety of wildlife, and are being lost to pinyon-juniper encroachment. Mule deer use stream corridors within aspen habitat for fawning and as movement corridors, and treatments would improve both mule deer access and habitat quality. About half of the cavity-nesting birds in the western U.S nest in aspen stands (DeByle 1985). Bird species richness and diversity in sagebrush communities are strongly and positively correlated with the presence of nearby aspen stands, while encroachment of pinyon-juniper into aspen stands negatively impacts bird species diversity and richness. Manual and manual treatments to remove encroaching pinyon-juniper would help to ensure the long-term health and longevity of aspen and other woodlands by removing competing pinyon-juniper and encouraging aspen stand regeneration via seeds and suckering.

The BLM would remove pinyon-juniper within 200 feet of aspen stands to improve their effectiveness as fire breaks. Fire breaks would help to protect mature aspen stands from fire and slow or compartmentalize wildland fire, to the benefit of wildlife and their habitat. Protective fencing in aspen stands would help to slow or reverse the loss of aspen habitat.

Pinyon-juniper Treatments

Adverse Effects

Treatments proposed by the BLM that remove or reduce pinyon-juniper habitat could adversely impact wildlife that use these woodlands. The types and magnitude of adverse effects would differ according to the pinyon-juniper phase that treatments are conducted in. In general, adverse effects to wildlife habitat would be less in Phase I than Phase II or III woodlands. Adverse effects from Phase I treatments to wildlife habitat would primarily be related to loss of woodland edge habitat. For example, ferruginous hawks use pinyon-juniper/sagebrush/grassland edge habitat for nesting and foraging. Treatments in Phase I woodlands would not impact species that use the understory vegetation because chainsaws would be the primary treatment tool. Phase I treatments would not target old growth pinyon-juniper, so bats and birds that use old growth stands would not be impacted. Chainsaw thinning in Phase I stands would cause only a slight increase of fuels and wildfire risk. Treatments in Phase II and III habitat would open up pinyon-juniper woodland to stimulate understory vegetation to the benefit of some species, but would also remove old trees that provide winter cover and trees with rough bark used by roosting bats.

Over 70 species of birds nest in pinyon-juniper, and removal of pinyon-juniper could adversely impact migratory birds that use pinyon-juniper, including gray flycatcher, juniper titmouse, Bewick's wrens, and black-throated gray warbler (Miller et al. 2005). Populations of several of these species are in decline despite the increase in pinyon-juniper on the landscape. These species generally favor stands that have an open canopy with a significant shrub understory, and the interface between pinyon-juniper and sagebrush; densely wooded interior locations and Phase III stands are generally bird poor (Noson 2002 *cited in* Miller et al. 2005, Great Basin Bird Observatory 2011).

Pinyon-juniper stands provide important winter habitat for wildlife. In Oregon, higher winter bird densities occur in open juniper woodlands than in any other plant community (Miller 2001). Mule deer are also an important inhabitant. Dense stands of pinyon-juniper provide habitat for mule deer during severe winter weather because of the reduced snow cover and increased thermal cover in these areas. Bats favor old growth trees that have rough bark and crevasses. Removal of pinyon-juniper in Phase II and III stands could mean a loss of this wildlife benefit. Pinyon-juniper woodlands also provide habitat structure that would be lost if woodlands were converted to grasslands (Maser and Gashwiler 1978).

Downed trees and other woody material left on the ground from thinnings and tree removal could serve as fuel for a wildfire. Slash from shredding and other treatments in late Phase II and Phase III woodlands can create a fire hazard for at least 2 years, and may leave sites vulnerable to the introduction of invasive plant species (Tausch et al. 2009, Gottfried and Overby 2011). Slash piles can aid in the establishment of new vegetation or seedlings and pose a long-term benefit for wildlife species that prefer more herbaceous and shrub cover. A delayed understory response to treatments is common, and it may be several years before a treated site regains full habitat value (Tausch et al. 2009). In the interim, the treated area may run the risk of noxious weeds and other invasive non-native vegetation colonization and associated decline in habitat value for wildlife species, or be at higher risk of erosion and associated declines in aquatic habitat quality if streams are nearby.

The BLM does not plan to conduct burns in Phase I stands, but would conduct stand-replacement burns that could treat several thousand acres annually in Phase II and III stands. As noted earlier, about 60 percent of treatments would occur in Phase II and III stands. These burns could have adverse and beneficial effects on pinyon jays and other wildlife. Prescribed fires would open up pinyon-juniper stands and stimulate the growth of native forbs and grasses. However, given that prescribed fire burns would be less selective in controlling vegetation than manual or mechanical methods, and several thousand acres (but no more than 70 percent of the area) per treatment area could be burned annually, there could be a loss of mountain and Wyoming big sagebrush and other shrubs that are desirable for pronghorn antelope and mule deer. Numerous studies have shown that it can take decades for Wyoming big sagebrush to recover from fire, and that sage-grouse avoid burn areas (Sage- and Columbian Sharp-tailed Grouse Technical Committee 2008). Treated areas must then be reseeded to ensure that burned areas do not become infested with noxious weeds and other invasive non-native vegetation, to the detriment of wildlife. It is likely that large, older pinyon-juniper trees that provide juniper berries and pinyon nuts for pinyon jay and mule deer would also be lost (Balda and Masters 1980). Removal of mature and decadent and diseased trees would eliminate habitat used by cavity-nesting birds, roosting bats, and small mammals. In addition, large burns create more homogenous conditions that are less favored by wildlife, and remove thermal and hiding cover needed by mule deer (USDOI BLM 1991c).

The large size of a treatment area may make it difficult for animals to flee during disturbance, especially fire, and may increase fire mortality. Species that are small or not very mobile may find it difficult to relocate into new, appropriate habitat in the wake of treatment activities, if the treated area is not immediately suitable for use. Greater sage-grouse chicks and roosting bats would likely not be able to escape fire. To minimize or avoid loss to Greater sage-grouse chicks, the BLM would not conduct treatments in brood-rearing areas, including the Atlas, Frazier, Gable, Henderson, Upper Roberts, and Vinini units, between May 15 and September 15 or as current policy dictates, including field verifications by BLM-approved biologists.Additional guidelines in Appendix C, Standard Operating Procedures, will also be followed.

Wildland fires for resource benefit in the Sulphur Spring Wildfire Management Unit would be allowed during the summer, and could be more intense than prescribed fires and could lead to noxious weeds and other invasive non-

native vegetation problems. At a minimum, it could take longer for native forbs and grasses to establish on sites burned by wildland for resource benefit than on sites burned with prescribed fire because wildfires tend to burn hotter and are more intense. Because of the large treatment area and the inability to anticipate when or where a wildfire would occur, there would be limited opportunities to control which areas burn in order to minimize the loss of Wyoming sagebrush or other more desirable vegetation, to survey for sensitive species, or to mitigate for impacts to sensitive wildlife species within the time frames described in the SOPs (**Appendix C**). Large-scale fires could also increase habitat fragmentation, to the detriment of birds including Brewer's sparrow, pinyon jay, and Virginia's warbler, and to less mobile species, such as reptiles and small mammals. Use of bulldozers and other firefighting equipment, and possibly aerial retardants, to protect private property could disturb wildlife and their habitats and cause harm or injury to less mobile species.

Beneficial Effects

Although one of the primary objectives of pinyon-juniper management is to improve woodland health and reduce the risk of high-intensity crown fires in dense woodland stands, treatments would also benefit wildlife by 1) removing pinyon-juniper to develop and enhance movement corridors for Greater sage-grouse; 2) removing pinyon-junipers to slow encroachment into Greater sage-grouse leking and nesting areas; 3) removing and thinning pinyon-juniper to break up the continuity of fuels and reduce the risk of catastrophic wildfire; and 4) improving wildlife habitat on the Sulphur Spring Wildfire Management Unit using wildland fire for resource benefit.

Most land managers target Phase I and II stands, which are often the most valuable to pinyon-juniper dwelling birds. Approximately 40 percent of treatments would be in Phase I stands and primarily involve the use of chainsaws to remove scattered trees. The BLM proposes to treat Phase II and III stands by opening up the canopy to stimulate growth in the shrub and herbaceous layers, and to reduce wildfire risk. About 40 percent of treatments would be in Phase II, and 20 percent in Phase III stands, using mostly mechanical methods, prescribed fire, and wildland fire for resource benefit (Sulphur Spring Wildfire Management Unit). While Phase I treatments may benefit Greater sage-grouse habitat, there may also be limited benefit to resident bird species that favor pinyon-juniper/sagebrush woodland edge habitat. By targeting Phase II and III stands, however, the BLM may enhance habitat for some pinyon-juniper dwelling species by opening up dense pinyon-juniper stands and creating more edge habitat (Great Basin Bird Observatory 2011).

As observed throughout the Great Basin, as pinyon-juniper cover has increased, the cover of shrubs and herbaceous understory species has declined, to the detriment of wildlife (Willis and Miller 1999 *cited in* Miller et al. 2005). The overall goal is to manage pinyon-juniper for wildlife by restoring the balance between pinyon-juniper and understory plants such as shrubs, grasses, and forbs (Miller 2001). All of the pinyon-juniper treatment sites are within mule deer summer or winter range, 60 percent of sites are within pronghorn summer or winter range, while about half of the treatment area is within Greater sage-grouse PHMA (see **Figures 3-39, 3-41,** and **3-42**; NDOW 2008b, 2009d).

Manual and mechanical treatments would be used to control the encroachment of pinyon and juniper into sagebrush, riparian, and aspen sites. The most common method to remove pinyon-juniper is with chainsaws. These treatments would generally occur in Phase I stands. With chainsaws, pinyon-juniper can be removed or thinned, while still retaining some patches for wildlife. Chainsaws offer flexibility in the timing of application and the ability to precisely control treatment boundaries or target specific trees, including selective cutting of diseased trees or leaving habitat trees. Some cut trees, slash, or chips would be left on site to control erosion, aid in seedling establishment, and provide wildlife habitat (Tausch et al. 2009). Miller et al. (1999) found that avian species diversity was greater on

plots where juniper was removed and slash remained than on closed woodlands. Pronghorn antelope and mule deer benefit from mechanical treatments by foraging on strips of grasses and forbs that would be created for fuel breaks.

Much of the focus of treatments would be on thinning or removing pinyon-juniper to benefit Greater sage-grouse and other wildlife using mechanical methods in Phase II and III stands. This would improve food and cover for small mammals by increasing shrub and herbaceous recruitment and seed production. Opening up dense stands of pinyon-juniper benefits edge species, ground-feeding and ground-nesting birds, and small mammals. Openings of 250 acres or less and created by mechanical means benefit deer, small mammals, and birds. Studies have shown that breeding bird densities increase as pinyon-juniper stands are opened up and treatments that create patches of treated and untreated pinyon and juniper promote species diversity (Scott and Boeker 1977, O'Meara et al. 1981, Payne and Bryant 1998). In addition to removing downed trees, the BLM would place larger wood into streams to slow water flow and provide habitat for amphibians and other wildlife.

In pinyon-juniper woodlands, female cone production declines as woods close in and the competition between trees increases; thinning or removing Utah juniper using manual and mechanical methods should enhance cone and seed production and improve food and cover for small mammals by increasing shrub and herbaceous recruitment and seed production. Juniper cones are consumed by deer mice, golden-mantled ground squirrel, Lewis' woodpecker, scrub jay, mountain bluebird, and cedar waxwing, and the berries are the primary winter food for American robin and Townsend's solitaire. Mule deer, mountain cottontail, and coyote also consume juniper cones, and woodrats, cottontail, black-tailed jackrabbit, and porcupine forage on juniper foliage at certain times of the year. There are reports of twice as many species and up to a 60 percent increase in deer mice, piñon mice, and Ord's kangaroo rat in thinned versus unthinned pinyon-juniper stands, and small mammal numbers generally increase when pinyon-juniper is thinned or completely cut, as long as slash remains (Miller et al. 2007).

Treatments on the Atlas, Frazier, Gable, Henderson, Upper Roberts, and Vinini units would help to open up Greater sage-grouse travel corridors between lower elevation winter and leking habitats and upper elevation nesting and brood-rearing habitats, by removing pinyon-juniper that are encroaching into these drainages. Treatments would also provide forage for Greater sage-grouse and other wildlife by promoting development of native grasses, forbs, and shrubs through removal of pinyon-juniper. Several studies have shown that Greater sage-grouse avoid pinyon-juniper stands and that the number of Greater sage-grouse using an area increases after pinyon-juniper removal (see review in USDOI USFWS 2008:60-61). In general, adult survival is high, but is offset by low juvenile survival (Crawford et al. 2004). Removal and thinning of pinyon-juniper in drainages should improve brood survivorship during movements from between breeding areas in the valleys and brood-rearing areas on Roberts Mountains, while these treatments in conjunction with riparian treatments should improve brood habitat and survivorship. Treatments could also benefit pinyon jays by opening up closed-canopy woodlands, while protecting old-growth pinyon-juniper habitat, and should ensure that roosting habitat is maintained for bats.

The Atlas and Henderson units provide habitat for pygmy rabbits. Pygmy rabbits forage primarily on sagebrush, so treatments that remove pinyon-juniper and stimulate the growth of sagebrush and herbaceous vegetation would benefit pygmy rabbits long-term. Pinyon-juniper encroachment has adversely impacted pygmy rabbit populations (Grayson 2006), and has shifted pygmy rabbit habitat to lower elevation in the western U.S. (Larrucea and Brussard 2008). Although pygmy rabbits would use areas with limited pinyon-juniper cover, stands with 40 percent or greater cover provide only marginal habitat for pygmy rabbits (Miller et al. 2005). Treatments to promote development of sagebrush, other shrubs, and herbaceous species would benefit pygmy rabbits.

Prescribed fire, in addition to manual and mechanical treatments, would be used to enhance habitats. Fire almost always reduces pinyon-juniper canopy or density, but is most effective when used in conjunction with mechanical treatments, that first reduce juniper competition and increase herbaceous growth that fuels the fire (Ansley and Rasmussen 2005).

The BLM would reduce hazardous fuels on up to 10,000 acres annually on the Cottonwood/Meadow Canyon, Dry Canyon, Three Bars Ranch, Tonkin North, and Whistler units. Proposed treatment areas provide important year-round habitat for Greater sage-grouse and pronghorn antelope, and crucial summer range for mule deer. In addition to reducing hazardous fuels and risk of loss of wildlife and their habitat from a catastrophic wildfire, treatments would improve shrub and herbaceous diversity, improve wildlife habitat, and improve hydrologic function. Treatments would kill most of the pinyon-juniper overstory and set back plant development and succession, and would increase forage for wildlife. When conditions are favorable for a stand-replacing fire, burning kills most of the pinyon-juniper overstory and increases plant diversity and patchiness. While loss of pinyon-juniper can reduce thermal and hiding cover for ungulates, an increase in plant species diversity after fire can benefit deer as well as ground-nesting birds (Lyon et al. 2000a, b).

In 2010 and 2011, the BLM mapped pinyon-juniper phases and areas with old-growth trees on the 3 Bars Project Area (AECOM 2011a). There are several old-growth pinyon-juniper stands on Roberts Mountains; these stands would be left untreated. Protection of old-growth pinyon-juniper favors wildlife species that preferentially use pinyon-juniper old-growth. Old-growth juniper have more cavities than young trees, and offer significant habitat benefit to cavity nesting species including red-breasted nuthatch, mountain bluebird, mountain chickadee, and northern flicker (Miller et al. 2005). Bushy-tailed woodrat is also common in old-growth pinyon-juniper, where it nests in cavities.

Sagebrush Treatments

Adverse Effects

Livestock could be used to remove cheatgrass. Livestock can directly harm wildlife by trampling on animals or their nests, and grazing can alter grassland structure, to the detriment of birds and small mammals (Wiens and Dyer 1975). Given that grazing would be limited to areas dominated by cheatgrass, which has low habitat value for wildlife, these risks to wildlife would be low.

In several treatment areas, the BLM would plant sagebrush seedlings and reseed with native grasses and forbs to encourage establishment of sagebrush and herbaceous vegetation near historic leks (Rocky Hills Unit), and to restore areas degraded by cheatgrass (West Simpson Park Unit, and Table Mountain Unit). The BLM would use native seeds and plants whenever possible, but could also use non-native grasses such as crested wheatgrass and forage kochia. Crested wheatgrass and forage kochia have limited value for most wildlife, including Greater sage-grouse. However, they do provide forage for livestock, wild horses, and other wild ungulates, help to stabilize soils and reduce erosion in areas burned by wildfire, and exclude cheatgrass. Non-native seedings would only be used 1) in areas that have previously burned and are beyond use of Emergency Stabilization and Rehabilitation techniques, 2) to create green strips; and 3) for soil stabilization in low precipitation zones.

Beneficial Effects

The 3 Bars Project area provides important habitat for Greater sage-grouse, mule deer, pronghorn antelope, and other wildlife. Approximately 98 percent of proposed treatment acres are within pronghorn antelope summer or winter

range, 65 percent are within summer or winter range for Greater sage-grouse, and 55 percent are within mule deer summer or winter range (see **Figures 3-39, 3-41,** and **3-42**; NDOW 2008b, 2009d, 2012d, e).

An estimated 50 percent of the original sagebrush habitat in the Great Basin has been lost in the past century, with increasing occurrence of wildfire being a major contributor to this loss (Sage- and Columbian Sharp-tailed Grouse Technical Committee 2009). Loss and degradation of sagebrush habitat has also occurred on the 3 Bars Project area, and proposed treatments would focus on restoring sagebrush habitat. Over 85 percent of the acres treated would occur where the BLM has determined that pronghorn antelope habitat is declining, nearly half of the acres treated would occur where Greater sage-grouse habitat is declining, and 45 percent of the acres treated would occur where mule deer habitat is declining (**Figure 3-40**).

Pinyon-juniper treatments to enhance sagebrush habitat would benefit sage obligate species, including Greater sage-grouse, sage sparrow, Brewer's sparrow, sage thrasher, pygmy rabbit, sagebrush vole, pronghorn antelope, and sagebrush lizard. Several shrub-steppe birds show population decreases when pinyon-juniper density and total area of cover increase. Sage thrasher in particular is very sensitive to pinyon-juniper encroachment into sagebrush, and one study found a 90 percent decline in a population with a 6 percent increase in pinyon-juniper cover. Brewer's sparrow and vesper sparrow are also sensitive to pinyon-juniper encroachment (Miller et al. 2005). Removing or thinning pinyon-juniper creates openings for raptors to use while hunting. Ferruginous hawks prefer more open country, sagebrush, and the periphery of pinyon-juniper and sagebrush. They nest in pinyon-juniper trees (Wildlife Action Plan Team 2012). Thus, treatments to create mosaic of pinyon-juniper and sagebrush habitat on the Whistler Unit, and to restore sagebrush on the Rocky Hills Unit, should benefit ferruginous hawks by making it easier for hawks to find prey, while creating new sagebrush habitat for prey species.

Removing pinyon-juniper from sagebrush habitat improves fawning habitat for mule deer, and improves browse resources (Wasley 2004). It also benefits pronghorn antelope, which preferentially use open, shrub-steppe communities (such as sagebrush) rather than stands with scattered trees or woodlands (Tsukamoto 2003, Wasley 2004). Pinyon-juniper encroachment has also impacted pygmy rabbit populations (Grayson 2006), especially when pinyon-juniper cover exceeds 40 percent. Pinyon-juniper removal projects on the Three Corners and Whistler Sage units could benefit pygmy rabbits, although treatments would occur in Phase I stands where pinyon-juniper cover is less than 40 percent. Because pinyon-juniper can uptake large amounts of water, removal of pinyon-juniper may also improve water supply and flow in creeks, which would benefit wildlife.

Chainsaws would be used to thin and remove pinyon-juniper in Phase I stands that have encroached into sagebrush habitat. The effects to wildlife and their habitat from pinyon-juniper removal and thinning in Phase I stands are discussed under Pinyon-juniper Treatments.

Several leks were found on the Rocky Hills Unit before the 1999 Trail Canyon Fire. West Simpson Park, which provides mule deer winter range, was also burned by the 1999 Trail Fire and is now dominated by cheatgrass. Table Mountain has been burned by several wildfires in the past few decades. It also has cheatgrass, and provides only marginal habitat for Greater sage-grouse, although several leks are nearby. Plowing and discing, and prescribed fire, could be used to reduce the reproduction of cheatgrass and crested wheatgrass. Treatments that break the fire-cheatgrass-fire cycle and risk of future wildfire on treated and nearby sagebrush habitat, should improve wildlife habitat by increasing the cover of native shrubs, grasses, and forbs that provide better habitat value for wildlife, and possibly encourage Greater sage-grouse to again nest in these units.

The BLM may use livestock and pathogens to control cheatgrass and other non-native vegetation, as livestock can reduce cheatgrass dominance, while a naturally-occurring pathogens such as *Ustilago bullata* can cause head smut in cheatgrass (Pellant 2002). The BLM may use livestock to remove some cheatgrass before other treatments. These treatments would be used to restore degraded rangeland that provides few wildlife benefits. Noxious weeds and other invasive non-native vegetation can hinder pygmy rabbit movement and increases a predators' ability to detect the rabbits. Treatments to control noxious weeds and other invasive non-native vegetation at West Simpson Park could encourage nearby pygmy rabbits to use this unit.

3.16.3.3.3 Direct and Indirect Effects under Alternative B (No Fire Use Alternative)

The types and magnitude of effects for manual, mechanical, and biological control treatments would be similar between Alternatives A and B. Because the BLM would not be able to use fire, there would be no harm to or loss of wildlife from prescribed fire and wildland fire for resource benefit. The few wildlife that use dense stands of pinyon-juniper would not experience habitat loss under this alternative, and may even see habitat gains as more pinyon-juniper habitat shows Phase II or III characteristics.

Acres and types of wetland and riparian habitat and miles of streams treated would be similar to Alternative A. However, less effort would be spent by the BLM on slowing pinyon-juniper encroachment into sagebrush and riparian communities; reducing the amount of Phase II and III pinyon-juniper treated using stand-replacement fires; restoring habitat where sagebrush should occur based on ecological site description reference, desired state, or management objective; and reducing the acres of priority habitat treated to improve species diversity, especially through cheatgrass control.

Because fire would not be available to reduce hazardous fuel loads, Alternative B may pose a greater long-term risk for wildfire due to the accumulation of fuels. The BLM would also be less able to promote more fire resilient and diverse habitat on the 3 Bars Project area.

The inability to use prescribed fire and wildland fire for resource benefit would probably have few short-term adverse effects. Long-term, however, mule deer, Greater sage-grouse, migratory birds, and other wildlife would experience fewer of the benefits associated both with creating openings in dense pinyon-juniper habitat and with creating a mosaic of pinyon-juniper and sagebrush habitat. Prescribed fire to treat non-native vegetation on the West Simpson Park Unit also would not be available under this alternative.

3.16.3.3.4 Direct and Indirect Effects under Alternative C (Minimal Land Disturbance Alternative)

Under Alternative C, the BLM would only be able to use manual and classical biological control methods to treat vegetation. The BLM has not identified areas where it would use classical biological control, but if nematodes, insects, or fungi are used on the 3 Bars Project area, treatments would generally be small in size and effects would be localized, or if used on cheatgrass, could cover large areas of habitat that are little used by wildlife. Thus, the effects on wildlife from classical biological control would be minor and primarily restricted to those species using vegetation treated by these methods. The BLM would not be able to use livestock to remove cheatgrass under Alternative C nor to reduce the competitiveness of exotic species such as crested wheatgrass and forage kochia on the Rocky Hills Unit.

Most of the treatments under this alternative would be to thin and remove pinyon-juniper using chainsaws where it is encroaching into riparian, aspen, and sagebrush habitats. There would be fewer direct impacts to wildlife from treatments under this alternative than the other alternatives, because adverse impacts, such as harm to or death of wildlife, and noise and other disturbances, would be much less with manual methods than the other methods. Since

fewer acres would be treated, there would be fewer benefits to wildlife under this alternative than under Alternatives A and B. Manual treatments would be small in scale and mostly targeted to pinyon-juniper stands. Benefits to special status species and migratory birds would primarily be limited to those species that use the pinyon-juniper and sagebrush interface, while Greater sage-grouse, pygmy rabbit, and other sagebrush dependent wildlife would see few benefits.

3.16.3.3.5 Direct and Indirect Effects under Alternative D (No Action Alternative)

There would be no direct effects to wildlife resources from 3 Bars Project treatments as no treatments would be authorized under this alternative. The BLM would not create fire and fuel breaks; thin and remove pinyon-juniper to promote healthy, diverse stands; thin or remove pinyon-juniper and sagebrush to encourage understory development; restore fire as an integral part of the ecosystem; or reduce the risk of a large-scale wildland fire to the benefit of wildlife and their habitats. Because no habitat would be restored, Alternative D also poses the greatest threat to special status species, including migratory birds, through long-term habitat loss and degradation. Species at greatest risk from habitat degradation are Greater sage-grouse, pygmy rabbit, northern goshawk, cavity nesting birds, and migratory birds through densification of pinyon-juniper and sagebrush, loss of aspen habitat, and pinyon-juniper encroachment.

3.16.3.4 Cumulative Effects

The wildlife CESA is approximately 1,883,729 acres and extends 10 miles beyond the 3 Bars Project area (**Figure 3-1**). Approximately 92 percent of the area is administered by the BLM, 6 percent is privately owned, and 2 percent is administered by the Forest Service. Past and present actions that have influenced wildlife resources in the 3 Bars ecosystem are discussed in Section 3.3.2.3.3.

3.16.3.4.1 Cumulative Effects under Alternative A (Preferred Alternative)

The BLM would continue ongoing management reviews to ensure proper livestock management and long-term success. Modifications will be made through a separate process from the 3 Bars Project.

The BLM may install small, temporary exclosure fencing to exclude livestock, wild horse, and other wild ungulate access to riparian and aspen treatment areas. These actions should help to improve water quality in affected streams, restore streams to Proper Functioning Condition, and improve riparian habitat to the benefit of amphibians, Greater sage-grouse, and other wildlife.

The BLM would continue to manage livestock to meet Greater sage-grouse habitat objectives. These objectives include having suitable sagebrush cover and utilization levels to ensure that adequate habitat would be available for Greater sage-grouse during all life stages (see further discussion in Section 3.3.2.3.3; USDOI BLM 2013c).

The BLM would continue to treat noxious weeds and other invasive non-native vegetation in areas with known infestations, including areas burned by wildfire or prescribed fire, and in new areas under the Early Detection and Rapid Response program. Noxious weeds and other invasive non-native vegetation would typically be found in newly burned or disturbed areas, along roads, near mining and energy developments, and in areas where livestock and wild horses congregate. These treatments would benefit wildlife and their habitats, except for those few species that use cheatgrass and other noxious and invasive species. Cheatgrass is usually most prevalent in areas that have been burned by wildfire.

Five herbicides are typically used on the 3 Bars Project area—2,4-D, glyphosate, imazapyr, metsulfuron methyl, and picloram. For the 3 Bars Project, it is likely that the BLM would also use imazapic to treat cheatgrass. Based on analysis done for the 17-States PEIS, formulations of 2,4-D could have moderate to high risks, while risks from the other herbicides to wildlife would have low to negligible risks to wildlife. A detailed analysis of the risks to wildlife and their habitat from the use of herbicides is provided in the 17-States PEIS (USDOI BLM 2007b:4-96).

Recreational use of the 3 Bars Project area would adversely impact wildlife by disturbing animals and possibly from fuel or other petroleum product spills from recreation vehicles that could impact drinking water. Wildlife could be injured or killed by recreational vehicles, or from illegal hunting. Visitor use of the CESA would result in increased risk of a wildland fire due to accidental or intentional ignition of vegetation from a campfire, cigarette, hot vehicle muffler, or other human-caused ignition source. Recreational users can spread noxious weeds and other invasive non-native vegetation that attaches itself to vehicles or to clothing or shoes, and can later cause new noxious weeds and other invasive non-native vegetation infestations and degrade wildlife habitat. Garbage and other debris left behind by recreational users could be ingested by wildlife and harm or kill animals, or attract ravens and other scavengers. As the local population increases, there would be increased hunting pressure on Greater sage-grouse and other wildlife. However, there are no studies that have demonstrated that regulated hunting is the cause of the decline of Greater sage-grouse in recent time (Connelly et al. 2004). Pine nut harvesting would cause a loss of pine nuts as food for wildlife.

Utility and infrastructure projects could kill, injure, or disturb wildlife, causing habitat loss and fragmentation, and possibly altering wildlife migration patterns and movements. Wildlife can strike fences and be injured or killed and be killed by vehicles on roads, and powerlines and communication sites may be used as perches by raptors, to the detriment of their prey. During a 10-year study of the effects of the Falcon-Gonder transmission line, which is in the eastern portion of the 3 Bars Project area, researchers found that counts of common ravens along the transmission corridor, and raven-associated disturbances of Greater sage-grouse leks, increased substantially during the 10-year period after construction of the transmission line. However, researchers did not find a meaningful impact of the transmission line on Greater sage-grouse nest survival (Collopy and Lammers 2005, Nonne et al. 2011).

Several studies have shown that mining and energy development can have a substantial impact on Greater sage-grouse habitat use and breeding success, and because of their large footprints, can fragment habitat (Braun et al. 2002, Lyon and Anderson 2003, Hollaran and Anderson 2004, Braun 2006, Great Basin Bird Observatory 2011; also see review in USDOI USFWS 2008), although habitat loss and fragmentation can be reduced over time as developments are reclaimed.

Construction and operation of the Mount Hope Project would directly affect wildlife habitat through removal of vegetation, primarily in the big sagebrush vegetation community. Approximately 8,318 acres of wildlife habitat would be directly removed. Upon completion, approximately 7,656 acres would be reclaimed by revegetating disturbed areas with shrubs, forbs, and grasses (USDOI BLM 2012b). The mine project would also cause death and injury to wildlife, disturb wildlife, and fragment wildlife habitat. Mule deer, Greater sage-grouse, and other wildlife migrations and movements would be impacted by the mine project. Mule deer migrate along routes from Pine Valley south around the Roberts Mountains into Kobeh Valley and Diamond Valley and could be affected by the Mount Hope Project.

Core breeding, brood-rearing, and wintering habitat for Greater sage-grouse is within the mine project area. The mine project could impact the movement of Greater sage-grouse between Kobeh Valley and Roberts Mountains. Other impacts to Greater sage-grouse from the mine project include increased raptor or scavenger predation from

elevated equipment and power poles; visual encroachment or interruptions created by elevated equipment, power poles, vehicular travel and dust; interruption of "bird foot traffic" created by above-ground pipes, extended elevated berms, or other linear features that may block passage; noise created by pumps, vehicles, and equipment; collision with fences and other structures; and unreclaimed surface disturbance resulting in habitat loss (USDOI BLM 2012b).

The mine project waste rock stockpile would be constructed over burrows and areas where pygmy rabbits have been sighted. In addition, the mine project access road and growth media stockpiles may also cover burrows and areas where pygmy rabbits have been sighted. These impacts would be limited to selected burrows and a limited number of individuals may be extirpated; these impacts are not expected to result in a population-level effect that would affect the potential listing of the species under the Endangered Species Act. The BLM has calculated that approximately 475 acres of pygmy rabbit habitat would be disturbed by the mine project. Of those 475 acres, 211 acres are occupied by pygmy rabbits and 264 acres are considered potential pygmy rabbit habitat.

One commenter during public scoping asked about the potential for reintroduction of Rocky Mountain bighorn sheep into the 3 Bars Project area. The NDOW does have plans to reintroduce bighorn sheep into the Cortez Range, which is immediately northwest of the 3 Bars Project area. These plans have been met with some resistance from local ranching interests, and the plan is currently on hold. There are no plans to reintroduce bighorn sheep on Roberts Mountains, as permittees are authorized to graze sheep on the mountain. Should sheep permits be retired or changed to cattle permits in the future, it is possible that NDOW could reintroduce bighorn sheep on Roberts Mountains (Foree 2012).

It is estimated that approximately 140,000 acres would be burned by wildfires over the next 20 years, and in some years wildfires may burn substantial acreage, based on acreage burned since 1985 in the CESA. About 75,000 acres burned in the 3 Bars Project area, and nearly 56,000 acres within remaining areas of the CESA, in 1999. In addition to concerns about how wildland fires may result in establishment and spread of noxious weeds and other invasive non-native vegetation, such as cheatgrass, there is concern that as wildland fire intervals increase, the likelihood of vegetation reaching late successional stages would be reduced, to the detriment of species that favor late successional habitat, such as sage thrasher and gray flycatcher (Great Basin Bird Observatory 2010).

In addition to treatments under the proposed action, the BLM also proposes to treat hazardous fuels on approximately 1,500 acres annually in high to very high fire risk areas on and near the 3 Bars Project area and within the CESA. These include treatments of pinyon-juniper and sagebrush using prescribed fire and manual and mechanical methods, to remove pinyon-juniper, enhance wildlife habitat, and create fuel breaks. In addition to improving wildlife habitat by creating a mosaic of habitats and opening up pinyon-juniper stands to promote development of shrubs, grasses, and forbs to the benefit of Greater sage-grouse and other wildlife, these treatments would also reduce the risk of wildfire and loss of wildlife habitat.

Under Alternative A, adverse effects from treatments would generally be short-term, while benefits would be long-term and would accumulate with wildlife habitat effects that occur on other portions of the CESA. Proposed BLM restoration projects would have short-term adverse and long-term beneficial effects on about 142,000 acres of wildlife habitat within the CESA during the life of the project. About 17 percent of the 3 Bars Project Area and 8 percent of the CESA would be treated to reduce hazardous fuels and improve ecosystem health and resiliency. Habitat improvement and a reduction in wildfire risk on the CESA would benefit wildlife and help offset some of the adverse effects to wildlife from other reasonably foreseeable future actions in the CESA, and would be greatest under Alternative A.

3.16.3.4.2 Cumulative Effects under Alternative B (No Fire Use Alternative)

Under Alternative B, effects from non-3 Bars Project reasonably foreseeable future actions on wildlife resources would be similar to those described under Alternative A. The BLM anticipates treating about half as many acres (63,500) on the 3 Bars Project area under Alternative B than under Alternative A. The types and magnitude of adverse impacts to wildlife from prescribed fire treatments, including loss of life and injury, loss of habitat, and habitat fragmentation, would not occur within the 3 Bars Project area, but could occur on several hundred acres annually within other portions of the CESA under current and reasonably foreseeable future authorization. Long-term benefits from prescribed fire and wildland fire for resource benefit, including improving pinyon-juniper health, stimulating aspen suckering, creating a mosaic of habitat, slowing pinyon-juniper encroachment, making vegetation more fire resilient, creating openings in pinyon-juniper habitat to promote shrub, forb, and grass development, and reducing the risk of catastrophic wildfire, would occur on only a few hundred acres annually under this alternative, under previous and reasonably foreseeable future authorizations, and would provide few benefits for wildlife.

Adverse and beneficial effects of 3 Bars Project treatments on wildlife resources would accumulate with those from other actions in the CESA. About 8 percent of the 3 Bars Project Area and 4 percent of the CESA would be treated to reduce hazardous fuels and improve ecosystem health and resiliency. The trend toward large-sized wildfires of moderate to high severity in sagebrush and large stand-replacing wildfires in pinyon-juniper should remain near current levels. Treatments to reduce this risk on the CESA would benefit wildlife and their habitats, but not to the extent as would occur under Alternative A.

3.16.3.4.3 Cumulative Effects under Alternative C (Minimal Land Disturbance Alternative)

Under Alternative C, effects from non-3 Bars Project reasonably foreseeable future actions on wildlife resources would be similar to those described under Alternative A. Because mechanical treatments would not be used, the BLM would not be able to use this method to stimulate aspen suckering on about 450 acres. The BLM would be less able to reduce the risk of pinyon-juniper encroachment into aspen stands, and thin and remove pinyon-juniper to create and enhance fire and fuel breaks to reduce the risk of wildfire destroying aspens.

There would be no risk of injury or death to wildlife from use of mechcanical equipment. The BLM would have less success in opening up pinyon-juniper to promote development of shrubs, grasses and forbs; reducing hazardous fuels; removing cheatgrass and other non-native species; creating a mosaic of habitats; creating fire and fuel breaks; restoring stream habitat; and reseeding and replanting vegetation to restore wildlife habitat compared to Alternatives A and B. The BLM would be able to use mechanical methods on several hundred acres annually for other projects in the CESA under Alternative C under current and reasonably foreseeable future authorizations, but the total amount of acreage treated using mechanical methods would be about 90 percent less than under Alternative A.

Under Alternative C, proposed restoration projects would have adverse and beneficial effects to about 47,000 acres of wildlife habitat within the CESA during the life of the project. Treatments would primarily restore pinyon-juniper and sagebrush habitat through thinnings and removal of pinyon-juniper. Wildfire risk to wildlife and their habitats would increase in the CESA. Wildlife species diversity and numbers, and habitat quality, would show little improvement under Alternative C, primarily because only about 2 percent of the CESA would be treated to improve wildlife habitat, and the BLM would be limited in the types of treatments it could conduct to reduce the risk of wildfire and improve wildlife habitat.

3.16.3.4.4 Cumulative Effects under Alternative D (No Action Alternative)

Under Alternative D, effects from non-3 Bars Project reasonably foreseeable future actions on wildlife resources would be similar to those described under Alternative A. There would be no cumulative effects on wildlife resources from 3 Bars Project treatments as no treatments would be authorized under this alternative. The BLM could create fire and fuel breaks; thin and remove pinyon-juniper to promote healthy, diverse stands; slow the spread of noxious weeds and other invasive non-native vegetation using ground-based and aerial application methods of herbicides, especially cheatgrass; restore fire as an integral part of the ecosystem; and reduce the risk of a large-scale wildland fire under current and reasonably foreseeable future authorized actions, but on a very limited acreage.

Based on historic treatments in the 3 Bars Project area, only about 1,500 acres would be treated annually in the CESA to reduce hazardous fuel levels and improve ecosystem health. Hazardous fuel levels would likely increase, and only a limited number of miles of fuel and fire breaks would be constructed under this alternative compared to the action alternatives. The BLM would conduct stream bioengineering and riparian habitat enhancements only on a limited acreage and these projects would have to be authorized through separate decisions. Thus, stream channels and riparian habitat would remain degraded and contribute to water quality concerns. The trend toward large-sized wildfires of moderate to high severity in sagebrush and large stand-replacing wildfires in pinyon-juniper would likely increase.

3.16.3.5 Unavoidable Adverse Effects

The proposed vegetation treatments could kill or harm wildlife, and cause unavoidable short-term adverse impacts to wildlife habitat and wildlife habitat use. The extent of these disturbances would vary by the extent and type of treatment. In general, greatest risks would be associated with the use of prescribed fire and wildland fire for resource benefit. These effects would be of special concern when they impact BLM Special Status Species, including Greater sage-grouse, pygmy rabbit, raptors, and bats.

3.16.3.6 Relationship between the Local Short-term Uses and Maintenance and Enhancement of Long-term Productivity

All treatments would have short-term adverse impacts to wildlife and their habitats. Treatments that improve habitat would provide long-term benefits to wildlife. Treatments that remove hazardous fuels from public lands and reduce the risk of a large, catastrophic wildfire would reduce the potential for future death and injury of wildlife and lead to improved habitat. Treatments that slow pinyon-juniper encroachment and control populations of noxious weeds and other invasive non-native species on public lands would be expected to benefit most wildlife over the long-term by aiding in the reestablishment of native vegetation and restoring wildlife habitat to near historical conditions.

3.16.3.7 Irreversible and Irretrievable Commitment of Resources

Wildlife habitat lost as a result of treatments would be irretrievable until native plant communities were reestablished, usually within several growing seasons. Treatments that improve rangeland and woodland ecosystem health, including removal of noxious weeds and other invasive non-native vegetation, slowing of pinyon-juniper encroachment, and enhancement of riparian, aspen, and sagebrush habitat, would translate into benefits for wildlife.

3.16.3.8 Significance of the Effects under the Alternatives

Under all alternatives, there would be a short-term (less than 10 years) loss of habitat due to proposed treatments, in particular pinyon-juniper, and cheatgrass and other noxious weeds and other invasive non-native species. However, pinyon-juniper is common throughout Nevada and the western U.S., and cheatgrass is an invasive weed with few wildlife values. Treatments would improve habitat on much of the 3 Bars Project area and CESA. Thus, there would be no significant direct, indirect, or cumulative long-term impacts to the quantity or quality of habitat critical to the survival of local populations from 3 Bars Project treatments within the 3 Bars Project area or CESA.

Under all alternatives, there would be injury or mortality to common wildlife species, primarily from use of prescribed fire and wildland fire for resource benefit, and from mechanical treatments. Less mobile species, such as amphibians, reptiles, and small mammals, would be most susceptible. Injury or mortality to wildlife would be in proportion to acres treated (greatest risk under Alternative A) and treatment methods (least risk under Alternative C). BLM Special Status Species, whose populations would be at most risk of not recovering in 5 years, are either mobile, could retreat to burrows, or use aquatic habitats to avoid fire and most mechanical treatments. Thus, populations of species that could be impacted by treatments should recover within 5 years, or should not suffer losses that would affect population viability. Thus, there would be no significant direct, indirect, or cumulative long-term impacts to local wildlife populations from 3 Bars Project treatments within the 3 Bars Project area or CESA.

The yellow-billed cuckoo is listed as threatened, under the Endangered Species Act on the CESA, however, the last sighting of yellow-billed cuckoo in or near the project area was in 1976, just outside of the southeast corner of the project area boundary. Thus, proposed treatments on the 3 Bars Project area or CESA would not result in the "take" of a listed species, or species proposed for listing.

Under all alternatives, there could be a short-term reduction in the population, habitat, or viability of a species of concern or sensitive species. However, these losses would not result in a trend toward endangerment or the need for federal listing. Species of greatest concern are the Greater sage-grouse, northern goshawk, pygmy rabbit, and several species of bats. Under all alternatives, the BLM would conduct treatments that would restore habitat for these species. The BLM would remove pinyon-juniper in Phase II and III stands, potentially to the detriment of bats that roost under the bark of these trees. However, pinyon-juniper is common in Nevada, the BLM would protect old-growth pinyon-juniper and conduct most treatments outside the period when bats would be using trees for roosts, and bats use other habitats for roosting and breeding in addition to pinyon-juniper. Thus bat populations should not be imperiled from treatments in the CESA. The BLM would avoid treatments near pygmy rabbit burrows, where feasible, on the 3 Bars Project area. In addition, most of the treatments on the 3 Bars Project area and CESA would benefit the sagebrush habitat used by Greater sage-grouse, pygmy rabbit, and other wildlife. The BLM would also improve aspen habitat to benefit northern goshawk. Thus, there should be a long-term gain in habitat value to species of concern on the CESA.

Under all alternatives, there could be a loss of birds, eggs, or nesting habitat critical to birds protected under the Migratory Bird Treaty Act, and should this loss occur, it could be significant. As discussed in **Appendix C**, the BLM would conduct nest surveys prior to any surface-disturbing activities that would occur during the avian breeding season. If nests are found within the treatment area, or if other evidence of nesting is observed, treatment activities may be postponed until after the completion of nesting; a protective buffer will be delineated and the buffer area will be avoided to prevent destruction or disturbance to nests and birds until they are no longer active; or the area will be removed from project consideration. The BLM will also avoid raptor and Greater sage-grouse nesting areas. However, there is no guarantee that all nests would be found, and it is possible that migratory birds or their nests or

young could be impacted by resource and other development in the CESA. The BLM would work with the USFWS to minimize or mitigate these losses.

3.16.4 Mitigation

Wildlife resources would benefit from mitigation measures identified in Section 3.18.4 (Livestock Grazing Mitigation). No mitigation or monitoring measures have been identified specifically for wildlife resources.

3.17 Wild Horses

3.17.1 Regulatory Framework

Management of wild horses and burros on BLM-administrated land is regulated under the Wild Free-Roaming Horses and Burros Act of 1971 and the multiple use objectives of the Federal Land Policy and Management Act. There are wild horses, but no wild burros, on the 3 Bars Project area. The Act requires that wild horse and burro populations be managed at levels that allow for the preservation and maintenance of a thriving natural ecological balance. Methods used to control wild horse and burro populations primarily involve gathers to remove excess animals, and fertility control through injections of immunocontraceptives to reduce population growth rates. The BLM is also guided by the Nevada Northeastern Great Basin Resource Advisory Council to promote healthy rangelands through implementation of standards and guidelines for maintaining healthy wild horse and burro herds on HMAs (USDOI 2007b). These include managing wild horses in HMAs based on the capability of the HMA to provide suitable feed, water, cover, and living space, and control of population levels to ensure the long-term health of wild horse populations.

3.17.2 Affected Environment

3.17.2.1 Study Methods and Study Area

BLM wild horse gather reports, monitoring data, and inventories were used to assess conditions of wild horses and their associated HMAs, including overall herd health, population compared to AML, and available water sources. The *2007 Roberts Mountain Complex Wild Horse Gather Environmental Assessment*, the *Roberts Mountain Complex Final Gather and Removal Report of January 2008*, the *2008 Roberts Mountain HMA Genetic Report*, the *2008 Callaghan Complex Wild Horse Gather Environmental Assessment*, the *Callaghan Complex Gather Report of February 2009*, and the *Callaghan Complex Genetic Report of 2009* provided much of the information for this assessment (USDOI BLM 2007h, 2008k, l, 2009g, h). The *Wild Horses and Burros Management Handbook H-4700-1* (USDOI BLM 2010l) was also consulted for information on wild horse management.

The study area for the assessment of direct and indirect impacts to wild horses includes the HMAs within the 3 Bars Project area as shown on **Figure 3-43**. Herd Management Areas are for long-term management of wild horses and are designated "Special Management Areas" on public lands. Establishment of HMAs must take into consideration the AML for the herd, the habitat requirements of the animals, and the relationships with other uses of public land.

The objective of the management of wild horses is to limit the animals' distribution to Herd Areas, which are areas of public lands identified as being habitat used by wild horses at the time of the passage of the Wild Free-Roaming Horses and Burros Act (43 CFR § 47000-5[d]). A herd is defined as one or more stallions and his mares and foals.

The CESA area for assessment of cumulative effects includes all of the HMAs that are contained within or partially overlap the 3 Bars Project area boundary.

3.17.2.2 General Herd and Herd Management Area Characteristics

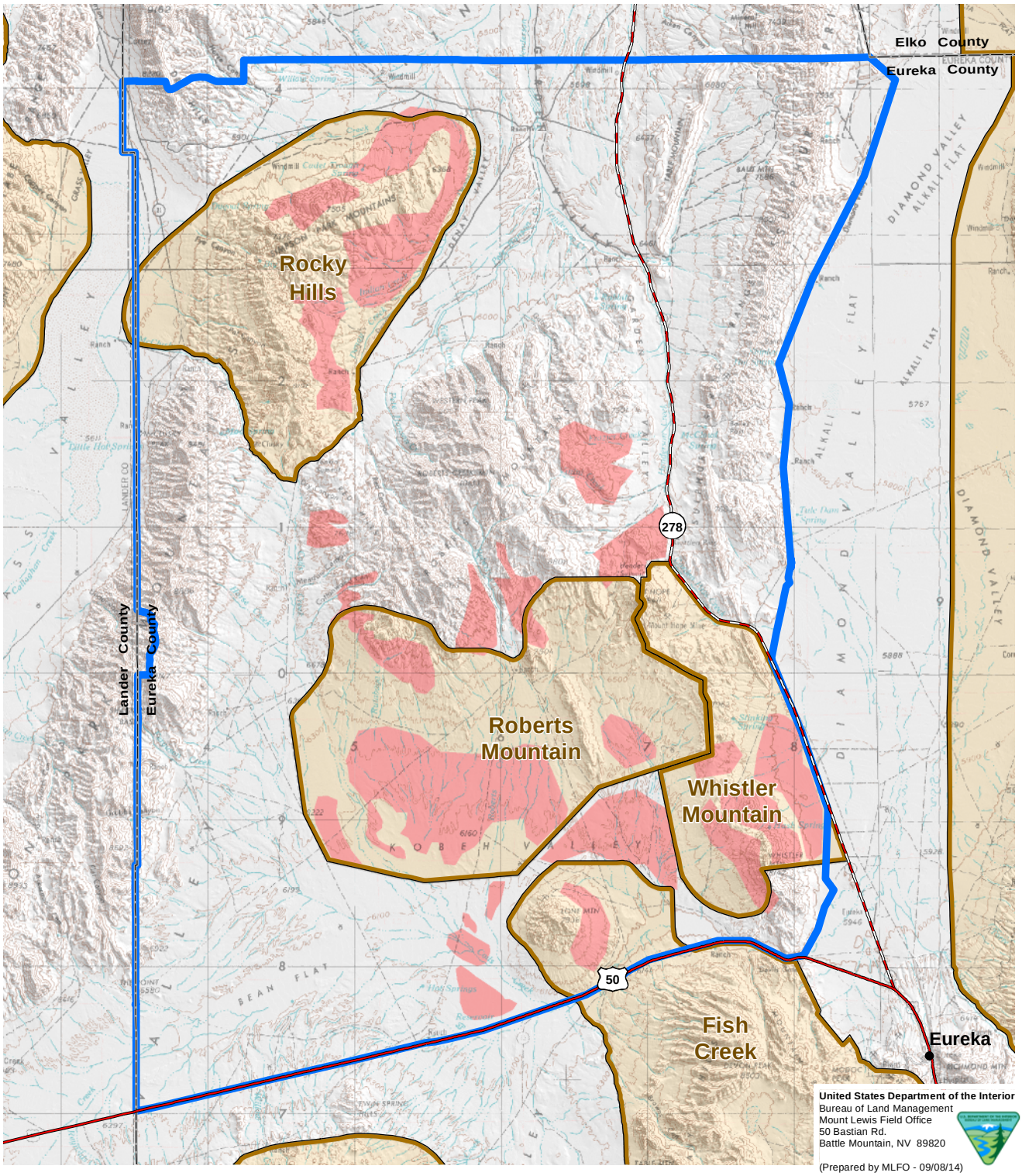
The 3 Bars Project area contains four HMAs—Fish Creek North[3], Rocky Hills, Roberts Mountain, and Whistler Mountain, totaling 246,536 acres. The HMAs are grouped into two different complexes. The Callaghan Complex consists of the Rocky Hills HMA and others not overlapped by the project area. The Roberts Mountain Complex contains the Roberts Mountain, Whistler Mountain, and Fish Creek North HMAs. Highway 50 divides Fish Creek North from Fish Creek South and precludes movement of the wild horses in the northern portion with the portion of the HMA south of U.S. Highway 50. As a result, the northern portion of the Fish Creek HMA is managed as a Complex with the Roberts Mountain and Whistler Mountain HMAs. Also included in this Complex is the Kobeh Valley Herd Area which is not currently designated as an HMA. The Kobeh Valley Herd Area surrounds the Fish Creek North HMA and wild horses pass through the Herd Area between the HMAs.

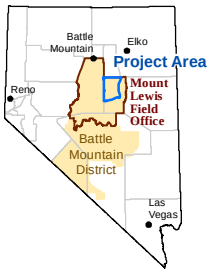
Limited year-round water sources, coupled with wild horse overpopulation, have resulted in wild horse concentrations in portions of the Roberts Mountain and Rocky Hills HMAs. Herd populations frequently exceed the desired AML due to inadequate gather frequency. As a result of populations over the AML, and limited forage and water during drought years, wild horse body scores declined and emergency gathers were required in portions of the Roberts Mountain Complex in 2001 and 2008. Permanent and temporary fences throughout the Rocky Hills and Roberts Mountain HMA hinder free-roaming abilities of wild horses in these HMAs.

Sampling of both the Rocky Hills and the Roberts Mountain Complex for genetic health indicates that the genetic variability of wild horses in these herds is high due to the population sizes and mixing between herds. The history of these herds is traced back to the early settlers of the area and the saddle horses used for ranch work. Some of the horses within the Rocky Hills HMA share traits with those of curly horses introduced into Nevada in the mid-1800s.

The BLM is required to maintain an inventory of wild horses or burros on public lands. Inventories are typically conducted using aircraft, and mostly by helicopter. A systematic grid is flown of the HMA using experienced observers. A direct count is obtained along with other monitoring data such as wild horse distribution, animal health, resource condition, and availability. Inventories are conducted every 2 to 3 years. During years when an inventory is not conducted, the Mount Lewis Field Office uses an average rate of increase derived from historical herd growth across the District, which is 17.5 to 19 percent annually, although the herd growth can fluctuate from year to year and among HMAs.

[3] The Fish Creek HMA exists on both the north and south sides of U.S. Highway 50, and is crossed by two rights-of-way fences. The portion of the HMA north of U. S. Highway 50 is referred to as Fish Creek North, though the HMA name has not yet been officially changed.





Legend

- Wild Horse Herd Management Area
- Areas Where Habitat Improvement is Needed
- 3 Bars Project Area

Source: BLM 2010m, 2012g.

3 Bars Ecosystem and Landscape Restoration Project

Figure 3-43

Wild Horse Herd Management Areas and Habitat Improvement Areas

0 1 2 3 4 5 10 Miles
0 1 2 3 4 5 10 Kilometers
N

3.17.2.3 Individual HMA Characteristics

Table 3-46 displays the HMAs that are within the project area, their approximate size, the established AML, and the estimated 2013 population following the spring 2013 foaling season. The most recent inventory for the Roberts Mountain Complex was completed in November 2012, with Rocky Hills completed in conjunction with the Callaghan Complex in August 2012[4].

3.17.2.3.1 Rocky Hills HMA

The Rocky Hills HMA is 50 miles southwest of Carlin, Nevada, in Eureka County. It is approximately 15 miles east to west and 13 miles north to south. The elevation ranges from 5,500 to 8,100 feet amsl. In 1999, the Trail Canyon Fire burned approximately 50 percent of the Rocky Hills HMA and forced a gather that resulted in the removal of 98 percent of the wild horse population. Three years later, 74 horses were released into the HMA, most over 9 years of age. The most recent gather in this HMA occurred in 2011 as part of the Callaghan and New Pass/Ravenswood Complex gather (USDOI BLM 2010n). The Rocky Hills HMA (in conjunction with the Callaghan Complex) has been part of a program to reduce population growth through limited removals and the application of fertility control since 2008. The objective is to return to these areas every few years to gather wild horses, re-treat the females with fertility control and remove only a few animals (primarily young animals), and release most of the population back to the range. During the most recent inventory in August 2012, it was noted that the population consisted of approximately 7 percent foals, which was markedly lower than untreated populations exhibiting composition of foals ranging from 16 to 20 percent.

TABLE 3-46

Herd Management Areas

HMA	Acreage	Appropriate Management Levels	2014 Population (estimated)
Rocky Hills	83,997	86-143	130
Fish Creek North[1]	19,300	6-10	6
Roberts Mountain	99,992	150	443
Whistler Mountain	43,247	14-24	20

[1] The portion of the Fish Creek HMA north of U.S. Highway 50 is shown in the table. The entire HMA, which extends south of U.S. Highway 50, exceeds 252,000 acres.

The Rocky Hills HMA wild horses are large horses and display a variety of colorations including paint, buckskin, grulla, appaloosa, roan, and dun. Horses may reach 16 hands (a hand is 4 inches) or taller, and may reflect some draft

[4] Annual average rate of increase used to compute the 2013 estimated population for Roberts Mountain Complex is 19 percent. The annual rate of increase used for Rocky Hills for 2013 was 12 percent. Fertility control applications are being used on the Rocky Hills HMA to reduce foaling rates.

horse traits such as heavy muscling and large bone structure. The wild horses in the Rocky Hills HMA are descendants of the saddle horses raised by the Demale Family at the JD Ranch prior to the passage of the Wild Free-Roaming Horses and Burros Act, and may include Morgan, Saddlebred, Quarterhorse, Thoroughbred, Appaloosa, and heavier draft breeds.

Wild horses within the Rocky Hills HMA have generally exhibited good health and body condition, and no issues with disease or genetic defects are known. Sex ratios and age structures are expected to be within normal ranges for wild horse herds.

The southern portion of the HMA tends to be under-utilized, with horses congregating in the northeastern portion. This is likely due to areas of thick pinyon-juniper cover and fencing that precludes wild horse access to water sources and movement in the southern portion of the HMA. Perennial streams, which may not flow year-round within the HMA, provide variable amounts of water to wild horses. Other intermittent or ephemeral drainages may provide water during periods of spring run-off or during wet years. Many areas in the northern three-quarters of the HMA have been identified as lacking or having poor water availability and quality.

3.17.2.3.2 Fish Creek North HMA

The Fish Creek HMA is west of Eureka, Nevada. Approximately 92 percent of the HMA is south of U.S. Highway 50 and is cut off from the north portion by highway rights-of-way fences that preclude wild horse movement. The north portion of the Fish Creek HMA, referred to as the Fish Creek North HMA, was once part of the Kobeh Herd Area of which portions were designated as a part of the Fish Creek HMA and the Whistler Mountain HMA. The Fish Creek North HMA is associated with the Roberts Mountain Complex. The portion south of U.S. Highway 50 is not associated with the 3-Bars project and is not discussed further. The Fish Creek North HMA is approximately 6 miles from east to west and 5 miles from north to south. The elevation ranges from approximately 6,030 to 7,900 feet amsl. The habitat consists of pinyon-juniper, black sagebrush, Wyoming big sagebrush, and sodic bottom vegetation types that are not highly productive. Horses from this HMA were last gathered with the Roberts Mountain Complex gather in 2008.

Wild horses make intermittent use of the Fish Creek North HMA, moving through Kobeh Valley and between the Roberts Mountain, Whistler Mountain, and Fish Creek North HMAs. Despite fences, wild horses have found places to cross into the Roberts Mountain HMA (USDOI BLM 2007h). It is suspected that the Whistler Mountain and Fish Creek North herds travel into the Roberts Mountain HMA for water and to seek higher elevations in the summer months, and Whistler Mountain and Fish Creek North HMAs during winter months when deeper snow covers higher elevations. Due to the proximity of the HMA to the Roberts Mountain and Whistler Mountain HMAs, and documented movement of these horses, wild horses most closely resemble the horses within the Roberts Mountain HMA.

3.17.2.3.3 Roberts Mountain HMA

The Roberts Mountain HMA is 30 miles northwest of Eureka, Nevada, and west of Highway 278. It is approximately 10 miles east to west and 17 miles north to south. The elevation ranges from 5,500 to 7,500 feet amsl (USDOI BLM 2008l). In January 2008, a gather was conducted and 308 wild horses were removed, leaving 118 to 123 in the HMA. The 2014 population estimate was 443 horses, or about 293 horses above the established AML.

Perennial streams, which may not flow year-round within the HMA, provide variable amounts of water to wild horses. Other intermittent or ephemeral drainages may provide water during periods of spring run-off or during wet

years. Few water sources exist in the southern and southwestern portion of the HMA. Forage in the low elevations that provides important winter range is also limited and is in a degraded state. As a result, concentrations of wild horses have been documented in portions of the HMA near available water sources, especially when the population exceeds the established AML. Additionally, wild horses move into higher elevations and into areas outside of the HMA to access water and forage. Wild horses are generally familiar with the location of fences and gates and are able to move within and outside of the HMA through gates and around drift fences (USDOI BLM 2007h). A large portion of the population exists outside of the HMA where use by wild horses has not been allocated. During the most recent inventory in November 2012, 56 percent of the wild horses were observed outside of the HMA boundary.

Wild horses of the Roberts Mountain HMA are known to have desirable traits. Size of the horses is typically larger than other wild horses, averaging 15 hands. Conformation of the animals is very good, with well-muscled shoulders and hindquarters typical of working stock ancestry. The wild horses include desirable colors including palomino, buckskin, and roan in addition to traditional colors of bay, brown, sorrel, and black. Health and body condition scoring of the Roberts Mountain HMA wild horses is typically adequate; however during drought or periods of overpopulation, forage in the lower elevation winter range becomes limited in relation to that needed to support a healthy population. This has resulted in emergency conditions in the past, specifically during the 2008 winter gather.

3.17.2.3.4 Whistler Mountain HMA

The Whistler Mountain HMA is 10 miles northwest of Eureka, Nevada, and west of Highway 278. It is approximately 7 miles from east to west and 16 miles from north to south. The elevation ranges from 5,900 to 8,225 feet amsl. This HMA was gathered with the Roberts Mountain Complex in 2008.

Intermittent and ephemeral channels provide negligible amounts of water, and areas in the central portion of the HMA lack or have poor water quality and availability. The western portion of the HMA has been under-utilized by wild horses in the past, partially due to lack of water sources. Wild horses commonly move from the Whistler Mountain HMA into the Roberts Mountain HMA or Kobeh Valley Herd Area. Lone Mountain Spring and Treasure Well in the Kobeh Valley (outside of the Whistler Mountain HMA boundary), are frequently utilized by wild horses from the Whistler Mountain and Fish Creek North HMAs.

No fences separate the Fish Creek North and Whistler Mountain HMAs, and horses move freely between them. Despite allotment boundary fences, wild horses have found places to cross into the Roberts Mountain HMA. It is suspected that the Whistler Mountain and Fish Creek North herds travel into the Roberts Mountain HMA for water and to seek higher elevations in the summer months, and use the lower elevations of Whistler Mountain HMA and Kobeh Valley during the winter months (USDOI BLM 2007h).

3.17.2.4 Conflicts among Wild Horses, Livestock, and Wildlife

Herd Management Areas within the project area overlap with grazing allotments (**Table 3-47**). The allocation of forage vegetation has to be adequate to support livestock, wild horses, and wildlife in a sustainable manner, otherwise forage for livestock, wild horses, and wildlife becomes degraded, as has occurred over much of the project area (**Figure 3-29)**. Typically, horses are treated very similar to livestock in terms of calculating AUMs, and dietary overlap between wild horses and cattle is very similar. Forage vegetation and water resources are also shared with wildlife.

3.17.2.5 Population Management and Control

Wild horses have relatively few natural predators, which allow their population rates to grow at an average rate of 18 to 25 percent per year (USDOI USGS 2012d). When unchecked, this rate of increase is greater than the rangeland can provide for and will begin to negatively affect the health of wild horses as well as wildlife. The Wild Free-Roaming Horses and Burros Act requires that wild horse and burro populations be managed at levels that allow for the preservation and maintenance of a thriving natural ecological balance. Current methods used to control wild horse populations include gathers and removals, adoption, and an immunocontraceptive (fertility control). Additional Population Growth Suppressants that could become available in the future include gelding of stallions or spay of a select number of mares, or implementation of improved fertility control formulations or methods. Any future gathers to implement Population Growth Suppressants would be documented through appropriate NEPA analysis.

TABLE 3-47

Allotments within Herd Management Areas

Herd Management Area	Allotment	Acreages	Percent of HMA	Percent of Allotment in HMA	Percent of Forage Allotted to Wild Horses (estimated)
Rocky Hills	Grass Valley	33,321	40	12	11
	JD	50,676	60	36	10-17
Fish Creek North	Lucky C	19,300	100	17	17
Roberts Mountain	Roberts Mountain	63,995	64	39	10
	Three Bars	35,997	36	45	
Whistler Mountain	Lucky C	12,109	28	11	17
	Romano	31,138	72	41	8

USDOI BLM (2007h, 2010m).

Several contraceptive methods have been explored since 1990, but most have proven to be ineffective. One method that has been effective is the injection of an immunocontraceptive known as Porcine Zona Pelludica, which is injected into mares during horse gathers. Porcine Zona Pelludica is a desirable method of fertility control for the following reasons (USDOI USGS 2012d):

- effects passively wear off and normal fertility can resume in 3 to 4 years;
- there is no harm if injected into mares that are already pregnant;
- research suggests that Porcine Zona Pelludica does not affect ovarian function or hormonal health;
- life span seems to increase (5 to 10 years) with improved health of treated mares, apparently due to the absence of stresses from pregnancy and lactation; and
- Porcine Zona Pelludica may be 90 percent effective in blocking fertility in mares for up to 3 years.

3.17.3 Environmental Consequences

3.17.3.1 Key Issues of Concern Considered during Evaluation of the Environmental Consequences

Based on information in the AECC and public scoping comments, the following concerns regarding wild horses were identified and are discussed in the effects analysis.

- Competition among wild horses, livestock, and wildlife for forage and water.
- Poor health scores recorded during horse gathers.
- Effects of project actions in and around foaling areas during the foaling season.
- Appropriate development of water sources to help disperse wild horses.
- The effect wild horses would have on project reclamation areas and the ability to achieve the desired goals.
- Injury or death of wild horses due to project activities.

3.17.3.2 Significance Criteria

Impacts to wild horses would be considered significant if BLM actions resulted in:

- Loss of habitat, forage, or water that results in adverse effects to the overall health of wild horses for more than 3 years after treatments.
- Interference with the historical distribution and movement patterns of wild horses within the affected HMAs.

3.17.3.3 Direct and Indirect Effects

3.17.3.3.1 Direct and Indirect Effects Common to All Action Alternatives

Restoration activities could have short-term effects on wild horses by exposing them to treatments that could harm their health, interfere with their movements, cause changes in vegetation that could alter the carrying capacity of the HMAs, or limit their access to water, which could ultimately affect their genetic health. Long-term, vegetation management activities would improve the amount and quality of forage, and potentially increasing the carrying capacity of the HMAs. Refer to Appendix C which describes the Standard Operating Procedures that would be followed in order to minimize impacts to wild horses during treatment efforts.

Adverse Effects

Forage Vegetation

Most treatment methods would result in a temporary loss of forage for wild horses. Even when vegetation is not physically damaged or removed, treated areas may require a minimum of 2 growing seasons of rest before they would be available to grazing animals and electric or other temporary fencing may be used to exclude wild horses from treatment areas, if necessary. The 2 year closure would be for areas where seeding or planting occurs. During this period, horses would have to utilize other portions of the HMA, which could increase competition with livestock and

wildlife for forage. Only temporary electric fencing would be used within HMAs to protect treatment areas. No barbed wire fencing would be used in HMAs except for small, temporary riparian or aspen exclosures.

Movement Patterns

Under the proposed action, the BLM could use small, temporary (usually less than 3 years) exclosure fencing to protect treatments in riparian and aspen management units. Temporary fencing generally would not impact wild horses if there is reliable water outside of the exclosure or a water gap, and interference with the movement patterns of wild horses would be negligible due to the small size of the exclosures. Temporary electric fencing could be used to protect treatment areas in sagebrush and pinyon-juniper areas for up to 2 years following treatment. Electric fencing may be used during critical times of the year, or year-round if necessary. No barbed wire fence would be constructed, except perhaps for small riparian or aspen exclosures. The treatment activities within the HMAs may cause disturbance to wild horses, causing them to move to other locations within the HMAs. As a result, there could be temporary changes to movement and distribution patterns in the HMA. Normal movement patterns would be expected to return once treatment activity is complete. Movement patterns are also influenced by population size, and other environmental conditions.

Beneficial Effects

With increased abundance of perennial desirable forage species, the overall quality of wild horse habitat would increase. Forage resources would be more abundant throughout the year, including during the winter months. Healthy, perennial forage species are better able to withstand drought, and would provide more abundant forage during drought. It is anticipated that treatments would reduce the risk of wildfire and resultant loss of habitat for wild horses, and move riparian vegetation communities closer to their Proper Functioning Condition and Potential Natural Community. Improved habitat would result in improved health of wild horses through heavier body weights, larger and healthier foals, and increased ability to survive during harsh winters and drought.

Forage Vegetation

Treatments that improve the quality and abundance of native forbs and grasses and reduce the cover of noxious weeds and other invasive non-native vegetation would benefit wild horses by increasing the acreage available for grazing and the quantity and quality of forage. Treatments that reduce the risk of future catastrophic wildfire through fuels reduction and construction of fire and fuel breaks would also benefit wild horses, as wildfires would cause the loss of forage and could lead to infestations of noxious weeds and other invasive non-native vegetation in burned areas.

Health

Treatments that improve habitat quantity and quality for wild horses should result in healthier horses, reduce the need for emergency removals, increase movement patterns, and maintain and improve genetic diversity, while preserving wild horse historic traits long-term.

Water Resources

Riparian treatments of springs and streams should help several streams achieve Proper Functioning Condition in the long-term and improve water flows and quality. Reduced stream velocities would improve riparian vegetation health, groundwater recharge, and water quality. Streams would be stabilized and more resilient. Removal of pinyon-juniper near streams could increase stream flows. Treatments to reduce hazardous fuels, remove noxious weeds and other

non-native vegetation, and restore native, fire resilient vegetation would reduce the risk of wildfire and its adverse impacts on water quantity and quality and peak flows.

3.17.3.3.2 Direct and Indirect Effects under Alternative A (Preferred Alternative)

Under Alternative A, the BLM would make substantial gains in improving forage and water quantity and quality, which would help to distribute wild horses more evenly over the 3 Bars Project area, and would improve the health of these animals.

Riparian Treatments

About 286 acres of riparian treatments would occur within HMAs, with most treatments in the Rocky Hills HMA (**Table 3-48)**. **Table 3-48** includes acres within the HMA boundaries and does not include acres of treatment outside of HMAs.

TABLE 3-48

Surface Disturbance by Herd Management Area for Treatment Types

HMA Name	Management Type (acres)				Total
	Riparian	Aspen	Pinyon-juniper	Sagebrush	
Fish Creek North	0	0	1,359	1	1,360
Roberts Mountain	25	0	18,572	4,352	22,950
Rocky Hills	229	0	5,611	9,175	15,014
Whistler Mountain	32	0	18,879	1,421	20,332
Total	286	0	44,421	14,949	59,656

Adverse Effects

Manual and mechanical treatments could temporarily reduce the amount of forage on the treatment site, and wild horses could experience short-term disturbances associated with mechanical noise and the presence of humans. However, since animals could leave the area during treatments, effects would be minor (USDOI BLM 2007c:4-100). Noise and other disturbances may require wild horses to find other water sources to avoid treatment activities. This could cause an increased use of other water sources and increased competition between other wild horses, livestock, and wildlife. These effects are expected to be temporary with normal use patterns resuming once treatments are completed.

Small, temporary exclosure fencing could be used to exclude wild horses from riparian treatment sites, although water gaps in the fencing would allow wild horses to access water within portions of the treatment area. The BLM would also use exclosure fencing at Denay Pond to prevent wild horses from entering most of this area and allow the site to restore naturally. A gap would be provided in the fencing to allow wild horses and livestock to access a small portion of the pond.

Beneficial Effects

By stabilizing channels, revegetating treatment sites, and creating appropriate access to water sources, the BLM would reduce erosion and return riparian systems to a Proper Functioning Condition for the benefit of wild horses.

Through these treatments, water quality, quantity, and duration would be improved within HMAs, with water availability improved during times of drought, including at Cadet Spring, which is an important water source for wild horses.

In areas where pinyon-juniper is removed, stream flows could increase due to reduced water uptake by pinyon-juniper; this would be beneficial to wild horses, especially during drought conditions. Downed trees could be cut into logs and logs placed into streams, slowing water flow and creating pools for use by wild horses.

Aspen Treatments

Treatments are proposed in the Simpson Park Northeast Unit, which is part of the Rocky Hills HMA. However, treatment areas have not been identified pending surveys in the unit, and thus treatment acreage is not included in **Table 3-48**. Adverse and beneficial effects from manual and mechanical treatment methods, and from the use of small, temporary exclosure fencing would be similar to those discussed under Effects Common to All Alternatives, and under Riparian Treatments.

Pinyon-juniper Treatments

About half (44,421 acres) of the pinyon-juniper treatment acres would be within HMAs (**Table 3-48**). Manual and mechanical methods and prescribed fire would be used to treat vegetation on all treatment areas within the Roberts Mountain, Rocky Hills, and Whistler Mountain HMAs; only manual and mechanical methods would be used within the Fish Creek North HMA.

Adverse Effects

Manual and mechanical treatments could temporarily reduce the amount of forage on the treatment site, and wild horses could experience short-term disturbances associated with mechanical noise and the presence of humans.

Prescribed fire could reduce the ability of the treatment area to support wild horses by removing native forbs and grasses, leading to the spread of noxious weeds and other invasive non-native vegetation and loss of forage (USDOI BLM 2007c:4-100). Wild horses are accustomed to migrating in search of food and shelter in response to climatic variation and natural disturbances that alter food supplies, however, the amount of area treated annually would comprise only a small portion of the HMAs.

Treatments could result in increased sediment loads into streams. The effects of treatments on water quality, and possibly on wild horse use, would be short-term in duration, with water quality returning to pre-disturbance conditions within several days or weeks after treatment is completed.

Beneficial Effects

Wild horses would benefit from treatments that encourage the growth of the native forbs and grasses. Treatments would also help to move the associated ecological sites toward their Potential Natural Community, since most of the acreage within the HMAs is early- to mid-seral status. If the forage amount was increased within a given HMA, wild horses would likely be better distributed within the HMA (USDOI BLM 2007c:4-101). Treatments could also improve winter forage and year-round access to water, and the ability of wild horses to move throughout the HMAs, which should result in improved genetic health.

The BLM proposes to remove pinyon-juniper in several drainages on Roberts Mountains that serve as travel corridors for Greater sage-grouse. By removing pinyon-juniper in these drainages and encouraging the establishment of grasses and forbs, the BLM would also provide forage for wild horses in these areas, and may assist wild horse movements between valley and mountain use areas.

Treatments that remove hazardous fuels and create fire and fuel breaks would also benefit wild horses by opening up additional habitat and foraging areas, as well as protecting habitat from future loss by reducing the risk of a large-scale catastrophic wildfire. The expected outcome is that a larger number of acres within HMAs would be utilized by wild horses, providing improved foraging and travel ways over the current conditions.

Sagebrush Treatments

About half of sagebrush treatments would occur within HMAs (**Table 3-48**). Over 90 percent of sagebrush treatment projects within HMAs would occur on the Rocky Hills (Rocky Hills Unit) and Roberts Mountains (Coils Creek, Nichols, and Roberts Mountain Pasture units) HMAs.

Adverse Effects

The types of adverse effects from manual and mechanical treatment methods would be similar to those discussed under Effects Common to All Alternatives, and under Pinyon-juniper Treatments. These include short-term loss of forage and effects on wild horses from noise and disturbance. The sagebrush treatment area overlaps with 6 miles of perennial streams and 16 springs (**Figure 3-22**; **Table 3-15**). Treatments near these streams and springs could impact water quality and flows and the BLM may exclude wild horses from portions of streams using small, temporary exclosure fencing.

The BLM would plant sagebrush seedlings and reseed with native grasses and forbs to encourage the establishment of sagebrush and herbaceous vegetation that would provide forage for wild horses. The BLM would use native seeds and plants whenever possible, but could also use non-native grasses such as crested wheatgrass. Crested wheatgrass provides forage for livestock and wild horses, especially during winter (Ogle 2006). However, the BLM could remove crested wheatgrass and forage kochia at the Rocky Hills Unit to enhance sagebrush cover, to the potential detriment of wild horses. While only up to 50 percent of the unit would be treated, crested wheatgrass provides more forage for wild horses than does native vegetation.

Beneficial Effects

Encroachment of pinyon-juniper and spread of noxious weeds and other invasive non-native vegetation are also factors contributing to the degraded condition of sagebrush habitats. By thinning pinyon-juniper, removing noxious weeds and other invasive non-native vegetation, and seeding and planting with native vegetation, perennial forbs and grasses would be able to achieve proper abundance, and distribution, and provide greater quantity and quality forage vegetation for wild horses. These improvements should help to facilitate wild horse movement and better distribute wild horses throughout the HMAs.

Sagebrush treatments would increase the understory cover of grasses and forbs that provide forage for wild horses. Manual and mechanical treatments could result in increased water runoff and erosion, to the possible detriment of water quality and aquatic habitat. Long-term, treatments should improve water flows and water quality to the benefit of wild horses. Treatments that reduce the risk of future catastrophic wildfire through fuels reduction, including removal of noxious weeds and other invasive non-native vegetation, would benefit wild horses. Uncontrolled, high

intensity wildfires can damage large tracts of rangeland, reducing its suitability for grazing Treatments that restore and maintain fire-adapted ecosystems, such as the appropriate use of mechanical thinning and fire, and creation of fuel breaks, would decrease the effects from wildfire to rangeland plant communities and improve ecosystem resilience and sustainability.

3.17.3.3.3 Direct and Indirect Effects under Alternative B (No Fire Use Alternative)

The types and magnitude of effects for manual, mechanical, and biological control treatments would be similar between Alternatives A and B. Because the BLM would not use fire, therefore, there would be none of the adverse effects associated with prescribed fire and wildland fire for resource benefit. In particular, prescribed fire would not contribute to degradation of wild horse habitat that could result from soil erosion, loss of forage, and spread of noxious weeds and other invasive non-native vegetation in burned areas. However, with greater reliance on mechanical methods, there may be greater disturbance to wild horses from use of mechanical equipment than would occur under Alternative A.

Acres and types of wetland and riparian habitat treated would be similar to Alternative A, and the BLM could use small, temporary exclosure fencing to protect treatment areas. However, fewer acres would be treated to slow pinyon-juniper encroachment into sagebrush and riparian communities, and fewer acres where sagebrush should occur based on ecological site description reference, desired state, or management objective would be restored. Thus, there would be fewer gains in habitat improvement and forage production outside of riparian zones.

Because fire would not be available to reduce hazardous fuel loads, Alternative B may pose a greater long-term risk for catastrophic wildfire due to the accumulation of fuels. The BLM would be limited in promoting more fire resilient and diverse vegetation on the 3 Bars Project area. Prescribed fire would not be used to remove downed wood and other hazardous fuels associated with thinning and removal of pinyon-juniper, thus increasing the risk of wildfire in pinyon-juniper treatment areas. These effects would not be beneficial to wild horses.

3.17.3.3.4 Direct and Indirect Effects under Alternative C (Minimal Land Disturbance Alternative)

Under Alternative C, the BLM would use manual and classical biological control methods to treat vegetation, and would treat about one-fourth as many acres as would occur under Alternative A. The types and magnitude of effects for manual treatments would be similar to those for the other alternatives. The consequences of not using fire under Alternative C would be the same as those discussed under Alternative B.

The BLM has not identified areas where it would use classical biological control, but if nematodes, insects, or fungi are used on the 3 Bars Project area, treatments would generally be small in size and effects would be localized, or if used on cheatgrass, could cover large areas of habitat that are little used by wild horses. Thus, the effects on wild horses from biological control would be minor and primarily restricted to those species using vegetation treated by these methods. The BLM would not use livestock to remove cheatgrass or reduce competition from crested wheatgrass and forage kochia under Alternative C.

Most of the treatments under this alternative would be to thin and remove pinyon-juniper using chainsaws where it is encroaching into riparian, aspen, and sagebrush habitats. Noise and other disturbance would be less with manual methods than the other methods. Manual and biological control methods result in less land disturbance than mechanical methods and as a result, short-term adverse effects to water quality from soil erosion, and loss of non-target vegetation, would be least under this alternative.

Without the use of mechanical equipment, the BLM would not conduct stream engineering and restoration, except on a limited basis on only a few stream miles. Fewer acres of noxious weeds and other invasive non-native vegetation would be controlled and fewer acres of pinyon-juniper thinning and removal would be conducted to promote understory development, except on very small areas where this vegetation can be hand pulled or controlled using hand tools. Reseeding and replanting of restoration sites would be limited to small areas where shrubs and other vegetation would be planted by hand; and fire and fuel breaks to reduce the risk of fire spread would only be created near existing roads or aspen stands, or along a few miles of stream. There would be little reduction in the risk of a catastrophic wildfire.

Under Alternative C, the BLM would not substantially improve the native vegetation community nor stop the loss of important ecosystem components. Wild horse movements and distribution, and availability and quality of forage and water, would be less under this alternative than the other action alternatives. These effects would be most noticeable during drought periods, harsh winters, or during periods of overpopulation. Thus, there would be negligible improvement in wild horse genetic diversity.

3.17.3.3.5 Direct and Indirect Effects under Alternative D (No Action Alternative)

There would be no direct effects to wild horses from 3 Bars Project treatments as no treatments would be authorized under this alternative. The BLM would not create fire and fuel breaks; thin and remove pinyon-juniper to promote healthy, diverse stands; or restore fire as an integral part of the ecosystem. Without treatments to reduce fuel loading or to control cheatgrass establishment and spread, the risk of catastrophic wildfires would continue to increase. Such fires could potentially lead to a catastrophic loss of wild horse habitat and create additional opportunities for invasive species to invade newly burned areas. The BLM would not conduct stream engineering and riparian habitat enhancement, and thus would do little to improve water availability and quality for wild horses. Thus, this alternative would do little to return the 3 Bars ecosystem to its Potential Natural Community and improve the genetic health of wild horses.

3.17.3.4 Cumulative Effects

The CESA for wild horses is approximately 320,579 acres and includes the area encompassed by all of the HMAs that are contained within and partially overlap the 3 Bars Project area boundary (**Figure 3-1**). Approximately 98 percent of the CESA is administered by the BLM and 2 percent is privately owned. Past and present actions that have influenced wild horses in the 3 Bars ecosystem are discussed in Section 3.3.2.3.3.

3.17.3.4.1 Cumulative Effects under Alternative A (Preferred Alternative)

Historic overgrazing and other natural- and human-caused factors have contributed to an increase in wildfire occurrence and intensity and to a decrease in native plant diversity, specifically in the understory of the sagebrush community. This has caused many sagebrush habitats to be far below their Potential Natural Community. These actions have led to the decrease of native forage to the detriment of wild horses, livestock, and wildlife. In addition, livestock congregation and concentrated use by overpopulations of wild horses near streams, springs, and wetlands, have contributed to the degradation of riparian habitat and forage and their ability to function properly.

The BLM would continue ongoing management reviews to ensure proper livestock management and the long-term success of the proposed treatments. Long-term, wild horse management activities would continue which includes wild

horse gathers, AML reviews and adjustments, removal of excess animals, and implementation of fertility control and other population growth suppressants

These management methods would help to reduce land disturbance and restore degraded habitats, and discourage establishment and expansion of noxious weeds and other invasive non-native vegetation, to the benefit of wild horses. The BLM may also install small, temporary exclosure fencing to limit livestock and wild horse access to treatment areas, although water gaps may be incorporated into fencing along streams to allow livestock, wild horses, and wildlife to access water. These actions should help to improve water quality in affected streams, restore streams to Proper Functioning Condition, and improve riparian habitat.

The BLM would continue to use ground-based herbicide applications to remove noxious weeds and other invasive non-native vegetation, and may use aerial-based herbicide applications to remove cheatgrass. The BLM would also use herbicides and other treatment methods to restore burned areas under the Burned Area Emergency Stabilization and Rehabilitation program, under existing authorizations. These treatments would occur on about 1,000 acres annually and would improve rangeland health and resiliency, improve forage and water for wild horses, move vegetation communities in areas that have been disturbed by past natural and human-caused action toward their Potential Natural Communities, and reduce the risk of catastrophic wildfire.

Five herbicides are typically used on the 3 Bars Project area—2,4-D, glyphosate, imazapyr, metsulfuron methyl, and picloram. It is likely that the BLM would also use imazapic to treat cheatgrass on the project area in the future. These herbicides, along with 13 other herbicides that could be used by the BLM, generally have negligible to low risks to wild horses at typical and maximum application rates. A more detailed discussion of the effects of herbicides on wild horses is in the 17-States PEIS (USDOI BLM 2007b:4-143).

Land development, mineral development, and oil, gas, and hydrothermal exploration and development could affect about 15,000 acres in the CESA in the reasonably foreseeable future, including about 14,200 acres of disturbance associated with the Mount Hope Project, and acreage associated with potential land sales (although it is unlikely that all of this land would be developed), materials sites, roads, and rights-of-way for roads, pipelines, and power and telephone lines.

The Mount Hope Project would have an impact on wild horses in the CESA, as discussed in the Mount Hope Project EIS (USDOI BLM 2012b:4-438 to 4-443). A perimeter fence would be constructed around the mine site to minimize direct impacts to wild horses from mining activities, including collisions with equipment. This fence would directly remove approximately 14,200 acres of wild horse habitat. The fenced area includes approximately 13,998 acres of designated HMAs, including portions of the Roberts Mountain HMA and the Whistler Mountain HMA. Roberts Mountain HMA wild horses would be excluded from about 7,836 acres, while Whistler Mountain HMA wild horses would be excluded from about 6,162 acres, as a result of the construction of the boundary fence. Project-related surface disturbance could also result in limiting wild horse access to developed and natural water sources in the mining area, and direct impacts could occur as a result of vehicular collisions along mine access roads.

Mine-related activities would result in direct impacts to the movement patterns of wild horses. The perimeter fence would exclude wild horses during mine operation and reclamation for approximately 70 years. Construction of the fence would result in wild horses moving to other parts of the HMA and potentially increasing the use of forage and water resources that may be already limited.

Noise disturbance, human presence, and increased vehicular traffic would be continuous for approximately 44 years during the mine project. Sudden loud noises, such as blasts, could cause wild horses to disperse in directions away from the sound. This behavior could send wild horses into unfamiliar terrain. Some wild horses may avoid the area while others may tolerate the noise and continue foraging and breeding activities in the vicinity of the mine. Distribution changes could result in concentrations of wild horses using vegetation resources in certain areas and increased utilization levels. For example, increased human disturbance and unavailable land in the Whistler Mountain HMA and east portion of the Roberts Mountain HMA could result in the population shifting to the west portion of the Roberts Mountain HMA, resulting in larger numbers of wild horses using smaller land areas. As a result, upland forage species could be heavily utilized. Some impacts could occur to wild horses during the peak foaling season if widespread human activity disturbs the population. As a result, new foals could be orphaned or abandoned.

In addition to the loss of vegetation associated with the Mount Hope Project, of particular concern is the potential drawdown of groundwater near the proposed Mount Hope Project. The mine project could have an impact on groundwater resources and could result in diminished surface water flows on Roberts Mountains, to the detriment of wild horses (USDOI BLM 2012b:3-438 to 3-439). In addition, the mine's perimeter fence would prohibit wild horse access to natural watering sources and forage.

As part of mitigation for the mine project, staff with the Mount Hope Project worked with the BLM to identify alternative water sources. Six locations within the Whistler Mountain and Roberts Mountain HMAs have been identified for development as water sources for wild horses and could also be used by wildlife and livestock. These sites consist of existing stock wells that are not currently functioning or do not have pumps or troughs and two new sources tapped from production wells associated with the Mount Hope Project. These sources would provide water where it has not been available previously, or where availability has been limited (USDOI BLM 2012b:3-439). These measures would help to offset potential impacts to wild horse movement, distribution, and habitat loss by providing additional water sources and improving habitat that has been underused in the past.

Upon mine closure and reclamation, the perimeter fence would be removed. The reclaimed land should have more grass and forb forage and less mature shrub forage than presently occurs. However, there would be no other actions taken to provide alternative forage for wild horses during the 70 year development, operation, and reclamation period.

Catastrophic wildfire can burn extensive acreage, particularly during drought conditions when soil and vegetation are dry. An estimated 85,000 acres would burn in the CESA during the next 20 years. To reduce this risk, hazardous fuels reduction, habitat improvement, and noxious weeds and other invasive non-native vegetation control projects would occur on about 66,000 acres within the HMAs, or about 26 percent of HMAs within the CESA (about 3 percent of the CESA annually). Treatments include stream channel restoration, removal of encroaching pinyon-juniper, thinning and removal of pinyon-juniper to stimulate development of grasses and forbs and reduce tree density, and creation of fire and fuel breaks.

Although the cumulative effects of human disturbance, mining and other development, and wildfire in the CESA would impact wild horse forage and water quality and quantity, continued management to improve forage and water quantity and quality, livestock adjustments, wild horse gathers, and reduction of hazardous fuels would help offset these effects, and improve wild horse habitat quantity and quality. Treatments also would improve the physical and genetic health of wild horse populations long-term, and lead to a better distribution of wild horses across the HMAs

within the CESA. Long-term benefits from treatments would be greater under this alternative than the other alternatives.

3.17.3.4.2 Cumulative Effects under Alternative B (No Fire Use Alternative)

Under Alternative B, effects from non-3 Bars Project reasonably foreseeable future actions on wild horses would be similar to those described under Alternative A. Under Alternative B, the BLM anticipates treating about half as many acres as under Alternative A. Fewer acres would be treated to reduce wildfire risk and its impacts on wild horse forage and water quality, including use of prescribed fire and wildland fire for resource benefit to restore natural fire regimes.

Adverse effects to vegetation within the CESA would generally be the same as described for Alternative A. However, by not using fire on the 3 Bars Project area, there would be no risks to vegetation and wild horse forage from fire on several thousand acres annually within the CESA. However, long-term benefits that could be derived from prescribed fire and wildland fire for resource benefit would not occur under this alternative, including improving pinyon-juniper health, creating a mosaic of habitats, slowing pinyon-juniper encroachment, making vegetation more fire resilient, creating openings in pinyon-juniper to promote shrub, forb, and grass development, and reducing the risk of catastrophic wildfire to benefit wild horse habitat.

Hazardous fuels reduction and habitat improvement projects and other land uses would occur on about 37,000 acres within HMAs, or about 18 percent of HMA acreage within the CESA (1 percent annually). Short-term adverse and long-term beneficial effects from 3 Bars Project treatments would accumulate with those outside the project area, but not to the same extent as would occur with Alternative A. Restoration treatments would benefit vegetation long-term, and should help to offset affects from land-use actions that are detrimental to vegetation. Thus, there would be minor short-term adverse effects, and long-term beneficial effects, from 3 Bars Project actions. Although 3 Bars Project treatments would improve the physical and genetic health of wild horses and help to better distribute wild horses across the 3 Bars Project area, these benefits would be less than for Alternative A, particularly in light of the cumulative impacts to wild horse habitat loss that could be realized from implementation of the Mount Hope Project.

3.17.3.4.3 Cumulative Effects under Alternative C (Minimal Land Disturbance Alternative)

Under Alternative C, effects from non-3 Bars Project reasonably foreseeable future actions on wild horses would be similar to those described under Alternative A. Under Alternative C, the BLM would only use manual and classical biological control methods to treat vegetation. As a result, the BLM anticipates treating about one-fourth as many acres under this alternative than under Alternative A.

Adverse, short-term effects to vegetation associated with the use of fire and mechanized equipment would not occur under Alternative C. The risk of wildfire and its impacts on the water and vegetation used by wild horses would likely increase on the 3 Bars Project area under this alternative. The BLM would not be able to use mechanical methods and fire to reduce hazardous fuels, create fuel breaks, thin and remove pinyon-juniper to promote more fire resilient vegetation, and remove downed wood and slash.

Under current and future authorizations, fire and mechanized equipment would be used on about 7,500 acres within other portions of the HMAs in the CESA to improve habitat, remove hazardous fuels, and reduce the risk of wildfire. Thus, restoration treatments would impact about 22,000 acres within HMAs, or about 9 percent of the HMAs in the CESA; less than 1 percent of the acreage on the CESA would be affected annually. These treatments would help to

restore plant communities back to their Potential Natural Community and would improve the physical and genetic health of wild horses, but not to the extent that would occur under Alternatives A and B.

3.17.3.4.4 Cumulative Effects under Alternative D (No Action Alternative)

Under Alternative D, effects from non-3 Bars Project reasonably foreseeable future actions on wild horses would be similar to those described under Alternative A. There would be no cumulative effects on wild horses from 3 Bars Project treatments as no treatments would be authorized under this alternative. The BLM could create fire and fuel breaks; thin and remove pinyon-juniper to promote healthy, diverse stands; slow the spread of noxious weeds and other invasive non-native vegetation using ground-based and aerial application methods of herbicides, especially cheatgrass; restore fire as an integral part of the ecosystem; and reduce the risk of a large-scale wildfire under current and reasonably foreseeable future authorized actions, but on a very limited acreage.

Based on historic treatments in the 3 Bars Project area, only about 1,500 acres would be treated annually in the CESA to reduce hazardous fuel levels and improve ecosystem health, and only about a third of these treatments would occur in HMAs. Hazardous fuel levels would likely increase, and only a limited number of miles of fuel and fire breaks would be constructed under this alternative compared to the action alternatives. The BLM would restore little riparian habitat. Thus, water quality would remain degraded and water availability could be limiting, especially during droughts, for wild horses. The trend toward large-sized wildfires of moderate to high severity in sagebrush and large stand-replacing wildfires in pinyon-juniper would likely increase. There would be few benefits to wild horse habitat, and their physical and genetic health, and comprehensive improvement to habitat components or movement patterns would not occur in the long-term.

3.17.3.5 Unavoidable Adverse Effects

The proposed restoration treatments would disturb wild horses and alter wild horse movements and habitat use, and cause the short-term loss of forage used by wild horses.

3.17.3.6 Relationship between the Local Short-term Uses and Maintenance and Enhancement of Long-term Productivity

The proposed treatments would affect the availability and quality of vegetation and water. These impacts would begin to disappear within 1 to 2 growing seasons after treatment. Because only a small percentage of HMAs would be treated annually, effects would be isolated, minor, and short-term.

All treatments that successfully reduce the cover of noxious weeds and other invasive non-native vegetation, thin pinyon-juniper to encourage growth of understory vegetation, and restore native vegetation on grazed lands would benefit wild horses by increasing the number of acres available for foraging and the quality of forage and resilience of vegetation to drought and harsh winters. Horses would also benefit from riparian treatments to increase water flows and improve water quality.

Treatments that reduce the risk of future catastrophic wildfire through fuels reduction would also benefit wild horses. Uncontrolled, high intensity wildfires can remove forage from large tracts of rangeland, reducing its suitability for wild horses. Treatments that restore and maintain fire-adapted ecosystems through the appropriate use of mechanical thinning, fire, and other vegetation treatment methods would decrease the effects of wildfire on rangeland plant communities and improve ecosystem resilience and sustainability.

3.17.3.7 Irreversible and Irretrievable Commitment of Resources

3 Bars Project treatments are not expected to result in an irreversible or irretrievable commitment of resources for wild horses.

3.17.3.8 Significance of the Effects under the Alternatives

None of the treatments under all alternatives should result in a significant long-term (greater than 5 years) loss of critical habitat, forage, or water that results in adverse direct, indirect, or cumulative effects to the overall health of wild horses, or interference with the normal distribution and movement patterns of wild horses within the affected HMAs. As discussed above, BLM treatments could have short-term effects on resources needed by wild horses, but would occur on less than 3 percent of the CESA annually. Small, temporary exclosure fencing associated with this and other projects would exclude wild horse access to portions of the CESA, but most of the area that is fenced would be the 14,000 acres of sagebrush and other habitat associated with the Mount Hope Project. Under all alternatives there would be long-term improvements in forage and water resources from BLM restoration treatments, the BLM would continue to provide wild horses access to water in or near riparian zones, and small, temporary exclosure fencing would be removed as soon as treatment sites are satisfactorily restored.

3.17.4 Mitigation

Wild horses would benefit from mitigation measures identified in Section 3.18.4 (Livestock Grazing Mitigation). No mitigation or monitoring measures have been identified specifically for wild horses.

3.18 Livestock Grazing

3.18.1 Regulatory Framework

The 3 Bars Project area is utilized by livestock on 12 grazing allotments administered by the BLM under the Taylor Grazing Act of 1934, as amended, the Federal Land Policy Management Act of 1976, as amended by the Public Rangelands Improvement Act of 1978 Grazing Regulations, and Public Land Orders. The BLM revised their grazing regulations in 1995 in order to ensure that livestock grazing practices are conducted in a manner that sustains or improves the ecological health of public rangelands. The revised regulations led to the development of the Northeastern Great Basin Area Standards and Guidelines (Standards and Guidelines), which established standards of rangeland health and livestock grazing. The intention of the Standards and Guidelines is to create a balance between sustainable development and multiple use while progressing towards desired rangeland conditions. The standards developed to achieve these conditions are as follows (USDOI 2007b):

Standard 1. Upland Sites: Upland soils exhibit infiltration and permeability rates that are appropriate to soil type, climate, and land form.

Standard 2. Riparian and Wetland Sites: Riparian and wetland areas exhibit a properly functioning condition and achieve state water quality criteria.

Standard 3. Habitat: Habitats exhibit a healthy, productive, and diverse population of native and/or desirable plant species, appropriate to the site characteristics, to provide suitable feed, water, cover and living space for

animal species and maintain ecological processes. Habitat conditions meet the life cycle requirements of threatened and endangered species.

Standard 4. Cultural Resources: Land use plans would recognize cultural resources within the context of multiple use.

Standard 5. Healthy Wild Horse and Burro Populations: Wild horses and burros exhibit characteristics of a healthy, productive, and diverse population. Age structure and sex ratios are appropriate to maintain the long-term viability of the population as a distinct group. Herd management areas are able to provide suitable feed, water, cover and living space for wild horses and burros and maintain historic patterns of habitat use.

3.18.2 Affected Environment

3.18.2.1 Study Methods and Study Area

Allotment acreage, AUMs, and livestock information (number, type, and season of use), were provided by the BLM. The study area for assessment of direct and indirect impacts to livestock and rangeland conditions is the 3 Bars Project area. The CESA for assessment of cumulative effects includes any allotment or portion of an allotment that is within the 3 Bars Project area.

3.18.2.2 Grazing Allotments

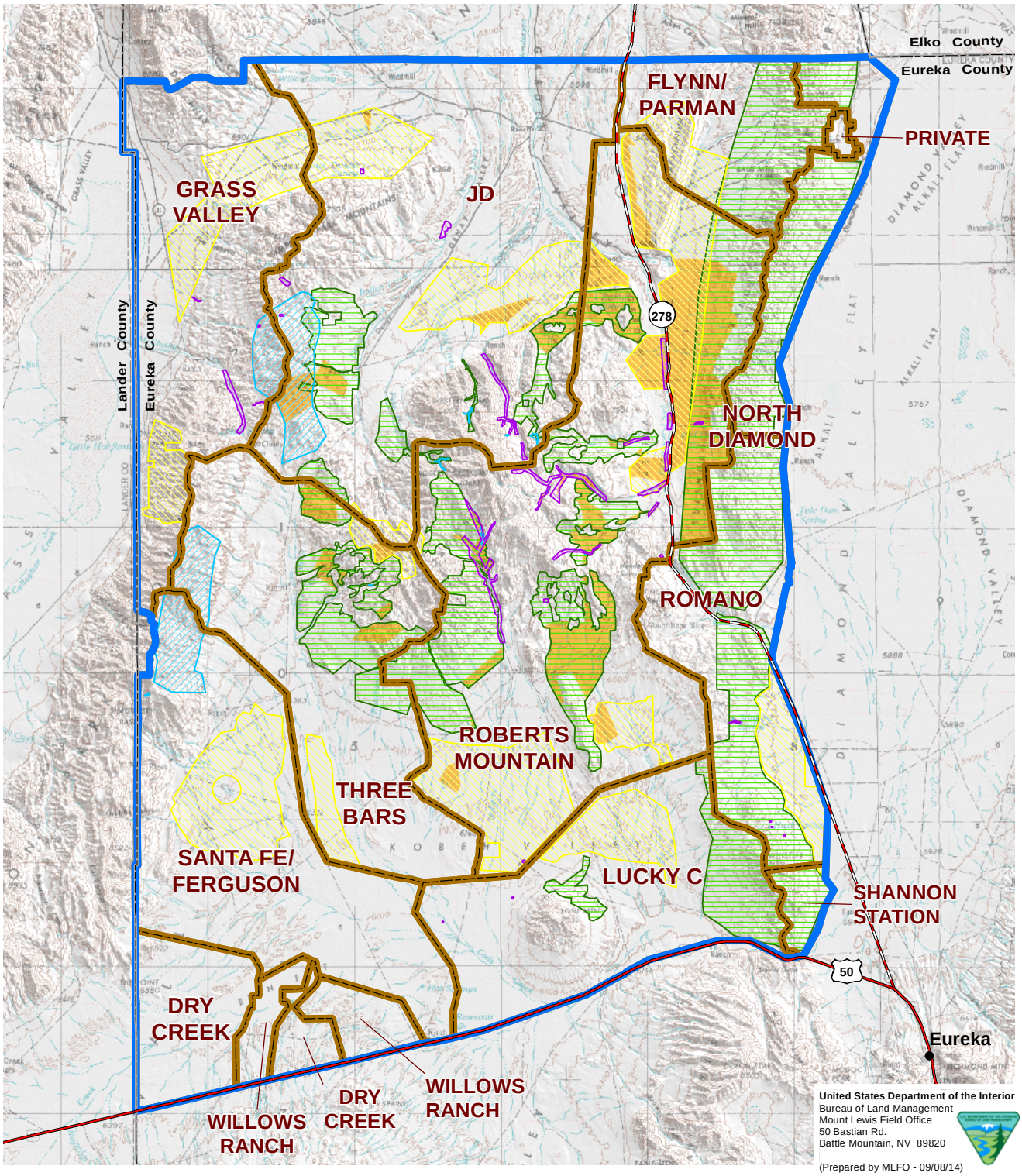
The 3 Bars Project area is made up of 12 grazing allotments on BLM-administered land (**Figure 3-44**). **Table 3-49** lists the allotments, total acreage, active AUMs, average acres per AUM, type of livestock, and season of use on the 3 Bars Project area. One AUM is the amount of forage required by an animal unit (AU) for 1 month, or the tenure of one AU for a 1-month period. If one AU grazes on an area of rangeland for 6 months, that tenure is equal to 6 AUs for 1 month or 6 AUMs. In general, the number of animal units, multiplied by the number of months they are on the range, equals the number of AUMs used (Ruyle and Ogden 1993). An AU is a standardized unit of measurement for range livestock that is equivalent to one mature cow and a calf up to 6 months, one horse, five sheep, or five goats, all over 6 months of age.

3.18.2.3 Grazing Management Systems

Grazing management systems determine how long livestock are allowed to graze in a given pasture or area. Improper livestock management can lead to the overuse of areas that are more desirable to livestock (near water sources, riparian zones, preferred vegetation types, etc.) and cause impacts. The use of various grazing rotation systems can achieve a more even use of rangelands and ensure a healthier rangeland with an increased ability to produce quality forage. Factors that are typically considered when developing a grazing rotation management system include grazing intensity, frequency, season of use, plant vigor and timing of growth, re-growth, seed production, and soil susceptibility to compaction. Fencing, salt and mineral supplements and artificial water sources can all be used to encourage livestock to utilize different areas or pastures. **Table 3-50** presents the management system for each grazing allotment within the project area. A description of grazing management systems follows (Wyman et al. 2006).

Rotation System - Scheduled movement of grazing animals from one pasture to another.

Rest-rotation System - Any grazing system that provides for the rotation of rest among pastures. The period of rest can be for a full year or more, or a portion of the growing season. The time and length of rest generally changes each successive year.



Legend

- Moderate to Severe Range Use
- Allotment Boundary
- 3 Bars Project Area
- Pinyon-juniper Treatment Area
- Sage Treatment Area
- Aspen Treatment Area
- Riparian Treatment Area

Source: BLM 2011g, 2013i.

3 Bars Ecosystem and Landscape Restoration Project

Figure 3-44

Range Use and Treatment Areas

0 1 2 3 4 5 10 Miles
0 1 2 3 4 5 10 Kilometers
N

TABLE 3-49

Grazing Allotments within the 3 Bars Ecosystem

Allotment Name - Number	3 Bars Project[1]	All Lands[2]				
	Total Acres	Total Acres	Active AUMs	Average Acres/AUM	Livestock Type	Season of Use
Three Bars - 00064	76,893	76,893	5,840	13	Cattle and Sheep	3/1-2/28
Dry Creek -10036	24,403	94,580	5,702	26	Cattle and Horse	3/1-1/31
Flynn/Parman - 10039	28,841	28,841	1,357	22	Cattle	3/15-11/30
Grass Valley - 10006	74,469	268,149	17,700	16	Cattle and Horse	1/1-1/31, 3/1-11/30
JD - 10041	140,749	140,740	7,921	12	Cattle	5/1-1/31
Lucky C - 10043	62,082	113,844	3,051	28	Cattle	4/15-2/28
North Diamond - 10034	22,846	76,950	3,579	22	Cattle	5/1-1/31
Roberts Mountain - 10046	164,079	164,079	9,624	16	Cattle and Sheep	1/1-12/31
Romano - 10047	47,829	75,847	2,887	26	Cattle	5/1-12/31
Santa Fe/Ferguson - 10049	76,514	83,480	5,202	16	Cattle and Sheep	3/1-12/1
Shannon Station - 10051	4,173	31,518	2,520	10	Cattle	4/1-2/28
Willows Ranch - 00062	10,678	51,421	3,621	18	Cattle	5/1-1/14

[1] Data reflect only the portion of the allotments on public land and do not include private lands within the 3 Bars Project area.

[2] Includes public and private lands within the 3 Bars Project area, and lands outside the project area.

TABLE 3-50

Allotment Grazing Management System and Category

Allotment	Management System	Number of Pastures	Management Category
3 Bars - 00064	Rest Rotation System	5	Improve
Dry Creek -10036	Rotation System	10	Improve
Flynn/Parman - 10039	Rest Rotation System	3	Improve
Grass Valley - 10006	Rotation System	24	Improve
JD - 10041	Rotation System	8	Maintain
Lucky C - 10043	Rotation System	4	Custodial
North Diamond - 10034	Rotation System	7	Custodial
Roberts Mountain - 10046	Rest Rotation System	19	Improve
Romano - 10047	Rotation System	10	Improve
Santa Fe/Ferguson - 10049	Voluntary Rotation System	1	Improve
Shannon Station - 10051	Rest Rotation System	8	Improve
Willow Ranch - 00062	Rest Rotation System	9	Maintain

Voluntary Rotation System - Movement of grazing animals in which the permittee volunteers to a more conservative grazing management approach that is given in the grazing management plan. This approach is developed in cooperation with the BLM to provide benefits to the permittee and to resources managed by the BLM.

3.18.2.4 Grazing Management Categories

In allotments where use areas have not been established, there may not be a requirement for the cattle to move through the allotment according to specific dates. It is up to the permittee to voluntarily rotate their cattle through the allotment in order to maintain appropriate distribution and utilization rates. Criteria used to assign each of these management approaches are as follows:

Improve - Allotments generally have the potential for increasing resource production or conditions, but are not producing at that potential. There may be conflicts or controversy involving resource conditions and uses, but there are realistic opportunities to improve resource conditions.

Maintain - Allotments are in satisfactory resource condition and are producing near their potential under existing management strategies. There are little or no known resource use conflicts or controversies.

Custodial - Allotments usually consist of relatively small acreages or parcels of public land. Acreages often intermingled with larger amounts of non-federal lands. There should be no known resource conflicts involving use or resource conditions. Typically, opportunities for positive economic returns from public investments are limited on these lands.

3.18.2.5 Range Improvements

The range improvements constructed within the project area include fencing, corrals, gates, cattle guards, and water improvement/supply projects. **Table 3-51** summarizes the improvements that occur in the affected allotments within the 3 Bars project area.

3.18.2.6 Allotment Evaluation Status

Rangeland health studies were conducted on six allotments between December 2010 and September 2011. As discussed in Section 3.12.2.3, Seventy KMAs within these allotments were assessed for their ecological status. These areas were selected because they met the following criteria:

- representative of larger areas of interest;
- contained within a single ecological site and plant community;
- contain key species; and
- capable of responding to management action that would be indicative of a response on a larger scale.

TABLE 3-51

Rangeland Improvements by Allotment

Allotment	Cattle Guard	Fencing (miles)	Corral	Gate	Spring	Man-made Water Supply[1]
Dry Creek	1	25				4
Flynn/Parman		37				
Grass Valley	4	126	1	4	36	8
JD	6	143	4	4	4	4
Lucky C		29				
North Diamond		42				
Roberts Mountain	2	159				
Romano		14				
Santa Fe / Ferguson		50	2			3
Shannon Station		<1				
Three Bars	6	67			13	1
Willows Ranch		21				1

[1] Includes reservoir, stock tank, and troughs.

The results of these studies were released in the *Final 3 Bars Ecosystem and Landscape Restoration Project Rangeland Health Report* (Eastern Nevada Landscape Coalition and AECOM 2012) and are summarized below. The analysis focused on the assessment of individual KMAs within each allotment and the condition of the KMA was extrapolated to the area within an allotment for which it represents. Within these KMAs, three parameters were used to measure overall rangeland health—production, desired dominant species, and Potential Natural Community for grass, forb, and shrub species. This EIS provides an overview assessment of rangeland health in the 3 Bars ecosystem as well as a more detailed analysis of six allotments that span the project area from the northern to southern extent. Current rangeland conditions are shown in **Figure 3-44**, and are in part based on this assessment and show that about 6 percent of the 3 Bars Project area has moderate to severe range use.

3.18.2.6.1 Flynn/Parman Allotment

The current grazing decision for the Flynn/Parman/Jiggs allotments was made on September 21, 1993. Approximately 28,841 acres of the allotment within the 3 Bars Project area are administered by the BLM. Six KMAs were studied within this allotment (**Table 3-32**). FP2 and FJ2 are within burn areas, the remaining four are not. Grass production and the desired dominant species were low or absent on five sites. Shrub production was low on five sites and the presence of desired dominant species was low or absent on five sites.

3.18.2.6.2 Roberts Mountain Allotment

The current grazing decision for the Roberts Mountain Allotment was made on October 20, 1994. Approximately 164,079 acres of the allotment are within the 3 Bars Project area and administered by the BLM. Sixteen KMAs were studied within this allotment (**Table 3-33**). RM9 and RM108 are within crested wheatgrass seeding areas and RM11 is within an herbicide treatment area. Grass production and/or Potential Natural Community were low in every KMA.

3.18.2.6.3 JD Allotment

The current grazing decision for the JD Allotment was made on September 24, 1994. Nineteen KMAs were studied within this allotment (**Table 3-34**). JD2, JD9, JD10, and JD15 are in burned areas. JD4 and JD5 are in the Willow Creek and Gabel Canyon seeding areas (1961 and 1964, respectively). The allotment has low grass production and lacks desired dominant grass species. Several areas lack desired dominant forb or shrub species.

3.18.2.6.4 Three Bars Allotment

The current grazing decision for the Three Bars Allotment was made on October 20, 1994. Approximately 76,893 acres of the allotment are within the 3 Bars Project area and administered by the BLM. Fifteen KMAs were studied within this allotment (**Table 3-35)**. Key Management Area TB19 is within the Trail Canyon Fire burn area. The allotment has low grass production and desired dominant species are low or absent. Some areas are below the Potential Natural Community for forbs and shrubs and lack the desired dominant species.

3.18.2.6.5 Romano Allotment

The current grazing decision for the Romano Allotment was made on September 27, 2004. Approximately 50 percent of the allotment (47,829 acres) is within the 3 Bars Project area and administered by the BLM. Nine KMAs were studied within the project area (**Table 3-36)**. Within this area, four seeding efforts have occurred. KMA RO7 and RO4B are within seeding areas. The allotment has low grass production and desired dominant species are low or absent. Several areas lack the desired forb species.

3.18.2.6.6 Lucky C Allotment

The current grazing decision for the Lucky C Allotment was made on September 27, 2004. Approximately 55 percent (62,082 acres) of the allotment is within the 3 Bars Project area and administered by the BLM. Of that portion, 1,078 acres are private land. Five KMAs were studied (**Table 3-37**). All are on the portion of the allotment that is within the 3 Bars Project area and administered by the BLM. Overall, the allotment has low grass production and various KMAs were rated low to absent for forb or shrub species.

3.18.2.6.7 Dry Creek Allotment

The grazing permit renewal for the Dry Creek Allotment was made on October 10, 2007. Approximately 24,403 acres of the allotment are within the 3 Bars Project area and administered by the BLM. Upland vegetation field observations indicate that appropriate perennial grass understory is lacking at all elevations. In the lower elevations, the perennial grass understory is typically limited to Sandberg's bluegrass.

3.18.2.6.8 Grass Valley Allotment

The current grazing decision for the Grass Valley Allotment was made on June 21, 2002. Approximately 74,469 acres of the allotment is within the 3 Bars Project area and administered by the BLM. Field surveys conducted in 1998 indicated that overall production of perennial grasses was below the site potential. Shadscale production was below site potential on the majority of sites surveyed. Additionally, Wyoming big sagebrush was experiencing die-off and cheatgrass was present to varying degrees in the lower- and mid-elevation ranges. A portion of the Grass Valley Allotment burned in the 1999 Trail Canyon Fire and some burn areas are infested with cheatgrass.

3.18.2.6.9 North Diamond Allotment

The current grazing decision for the North Diamond Allotment was made on January 5, 2000. Approximately 22,846 acres of the allotment are within the 3 Bars Project area and administered by the BLM. Surveys conducted in 1998 found that over 80 percent of the desired dominant grass species were below the Potential Natural Communities for the site, however, they were present on three of the five sites surveyed. These species included Indian ricegrass, needle-and-thread, bluebunch wheatgrass, and basin wildrye. On one area, 100 percent of the antelope bitterbrush was mature or decadent and there was no recruitment. Additionally, cheatgrass was prevalent in the lower elevation understory.

3.18.2.6.10 Santa Fe/Ferguson Allotment

The current grazing decision for the Santa Fe/Ferguson Allotment was implemented by the Shoshone-Eureka RMP on November 6, 1987 and the Shoshone-Eureka Rangeland Program Summary in 1988. Approximately 76,514 acres of the allotment are within the 3 Bars Project area and administered by the BLM. This allotment has not been evaluated by the BLM.

3.18.2.6.11 Shannon Station Allotment

The current grazing decision for the Shannon Station and Spanish Gulch Allotment was made on January 5, 2000. Approximately 4,173 acres of the allotment are within the 3 Bars Project area and administered by the BLM. Surveys conducted in 1998 indicated that desired dominant grass species were present at six of nine sites surveyed. These species included Indian ricegrass, needle-and-thread, and bluebunch wheatgrass. Cheatgrass comprised approximately 25 percent of the understory community.

3.18.2.6.12 Willow Ranch Allotment

The current grazing decision for the Willow Ranch Allotment was made on May 18, 1994. Approximately 10,678 acres of the allotment are within the 3 Bars Project area and administered by the BLM. An allotment evaluation hasn't been conducted for the Willow Ranch Allotment since 1994. At that time, it was determined that overgrazing was compromising the health of the allotment. The Final Multiple Use Decision that followed the evaluation reduced the permitted AUMs by 1,749 to 3,621.

3.18.3 Environmental Consequences

3.18.3.1 Key Issues of Concern Considered during Evaluation of the Environmental Consequences

Based on information in the AECC and public scoping comments, the following concerns regarding livestock grazing and rangeland conditions were identified and are discussed in this impact analysis:

- Impacts on ranching operations as a result of livestock exclusion areas.
- Effects of livestock on project reclamation areas and the ability to achieve desired goals.

3.18.3.2 Significance Criteria

Impacts to livestock would be considered significant if BLM actions resulted in:

- Long-term (greater than 10 years) change in forage availability that measurably affects livestock grazing.
- Long-term (greater than 5 years) change in access to water that measurably affects livestock grazing.

3.18.3.3 Direct and Indirect Effects

3.18.3.3.1 Direct and Indirect Effects Common to All Action Alternatives

Vegetation management activities could affect livestock by exposing them to treatments that could harm their health, interfere with their movements, cause changes in vegetation that could positively or negatively alter the carrying capacity of the allotments, or limit their access to water. Alternately, vegetation management activities could improve the amount and quality of forage, potentially increasing the carrying capacity of the allotments.

Adverse Effects

Forage Vegetation

Some treatment methods could result in a temporary loss of forage available to livestock. Even when vegetation is not physically damaged or removed, treatment areas could require a minimum of 2 growing seasons of rest if they are reseeded or replanted before they would be available to livestock (see Section 3.18.4 for mitigation measures related to livestock closures). This period could be extended if the project area experiences prolonged drought conditions. During this period, ranch operators would have to utilize other portions of the affected allotments. This could have the potential to temporarily reduce the number of livestock that an allotment could carry or necessitate providing salt and mineral supplements.

Health

It is possible that small, temporary exclusion fencing around treatment areas could cause injury to livestock if they run into the fence or try to breach the fence. Livestock could be excluded from treatment areas during the treatment to reduce risk of harm from prescribed fire and other treatments.

Movement Patterns

Under the proposed action, the BLM could use small, temporary exclosure fencing to protect treatments in riparian and aspen management units. Temporary fencing generally does not harm livestock if there is reliable water outside of the exclosure or if gaps are created in the exclosure to allow livestock to access portions of the water source. Temporary exclosure fencing could interfere with livestock use of treatment areas and could interfere with the movement patterns of livestock. Treatment areas could be closed to livestock for at least 2 growing seasons after treatment.

Water Resources

Stream treatments would result in short-term water quality degradation from soil erosion and sedimentation of streams. Small, temporary exclosure fencing could be used to exclude livestock from riparian treatment areas for at least 2 growing seasons to allow treatment areas to stabilize and to encourage growth of native vegetation. The BLM would work with the affected permittee(s) to ensure water is available for livestock.

Beneficial Effects

Forage Vegetation

Treatments that successfully improve the quality and abundance of native forbs and grasses, and reduce the cover of noxious weeds and other invasive non-native vegetation on rangelands, would benefit livestock. In addition, some noxious weeds are poisonous to livestock. The success of noxious weeds and other invasive non-native vegetation removal would determine the level of benefit of the treatments over the long-term. Treatments that reduce the risk of future catastrophic wildfire through fuels reduction and construction of fire and fuel breaks would also benefit livestock. Wildfires would result in the loss of forage and could lead to infestations of noxious weeds and other invasive non-native vegetation in burned areas.

Health and Movement Patterns

Treatments that improve woodland, rangeland, and riparian health, productivity, and functionality would benefit livestock. Risks to livestock health and movement from small, temporary exclosure fencing could be reduced by removing temporary fencing from treatment areas as soon as areas have stabilized and native vegetation has reestablished on the site.

Water Resources

The Grass Valley, JD, Lucky C, Roberts Mountain, and Romano allotments could all receive riparian treatments. Riparian treatments should help several streams achieve Proper Functioning Condition and improve water flows and quality to the benefit of livestock. Removal of pinyon-juniper near streams could increase stream flows. Treatments to reduce hazardous fuels, remove noxious weeds and other invasive non-native vegetation, and restore native, fire resilient vegetation, would reduce the risk of wildfire and its adverse impacts on forage and water quality and quantity to the benefit of livestock.

3.18.3.3.2 Direct and Indirect Effects under Alternative A (Preferred Alternative)

Riparian Treatments

The BLM has identified about 3,885 acres of riparian zone treatments. Of these, about 2,731 acres of treatment would occur on the Roberts Mountain Allotment, 547 acres on the JD Allotment, and 319 acres on the Grass Valley Allotment (**Table 3-52)**. Adverse effects from manual treatments would be similar to those discussed under Effects Common to All Alternatives. Use of mechanical treatments could negatively affect plants by compacting soils, creating bare ground, and uprooting desirable species, and could temporarily reduce the amount of forage on the treatment site.

Small, temporary exclosure fencing could be used to exclude livestock from riparian treatment sites for a minimum of 2 growing seasons to allow riparian conditions to stabilize. The BLM would work with the affected permittee(s) to ensure water is available for livestock.

Beneficial Effects

Beneficial effects from manual treatments and fencing would be similar to those discussed under Effects Common to All Alternatives.

All treatments would help to improve riparian habitat and forage and drinking water for livestock. Treatments would also reduce the risk of future catastrophic wildfire through removal of pinyon-juniper and creation of fire and fuel breaks to the benefit of livestock. Because of these actions, it is anticipated that riparian vegetation communities would move closer to the Potential Natural Community.

TABLE 3-52

Acreage Affected by Treatment Types for each Allotment under Alternative A

Allotment Name	Treatment Type				Total
	Riparian	Aspen	Pinyon-juniper	Sagebrush	
	Acres	Acres	Acres	Acres	Acres
Three Bars	0	0	10,909	996	11,905
Dry Creek	0	0	0	0	0
Flynn/Parman	0	0	5,361	1,538	6,899
Grass Valley	319	0	0	7,435	7,754
JD	547	62	10,009	6,091	16,709
Lucky C	4	0	8,624	1,519	10,147
North Diamond	0	0	7,157	0	7,157
Roberts Mountain	2,731	77	30,153	9,699	42,660
Romano	32	0	16,394	1,341	17,767
Santa Fe/Ferguson	8	8	0	2,680	2,696
Shannon Station	0	0	2,880	16	2,896
Willow Ranch	0	0	0	0	0
Total	3,641	147	91,487	31,315	126,590

In areas where pinyon-juniper is removed, stream flows could increase due to reduced water uptake and capture of rainfall by pinyon-juniper. This would be beneficial to livestock, especially during drought conditions. Downed trees could be cut into logs and logs placed into streams, slowing water flow and creating pools for use by livestock. Stream channel restoration, removal of pinyon-juniper, and removal of noxious weeds and other invasive non-native vegetation would allow riparian zones to function as fire breaks, helping to reduce the risk of wildfire to riparian zones and loss of forage and degradation of water quality, all of which would benefit livestock.

Aspen Treatments

Adverse and beneficial effects from manual and mechanical fire treatment methods, and from the use of small, temporary exclosure fencing, would be similar to those discussed under Effects Common to All Alternatives, and under Riparian Treatments. Treatments would occur in the JD, Roberts Mountain, and Santa/Fe Ferguson allotments.

Pinyon-juniper would be removed near aspen stands and nearby roads. These clearings would function as fire breaks, helping to reduce the risk of wildfire to aspen and nearby habitats and degradation of water quality and loss of forage to the benefit of livestock.

Pinyon-juniper Treatments

Treatments would occur on most allotments, with largest treatment acreages on the Roberts Mountain, Romano, JD, and Three Bars allotments (**Table 3-52**).

Adverse Effects

Effects from manual and mechanical treatments could be associated with loss of forage and disturbance. About 57 percent of treatments where the objective is to improve sagebrush habitat by thinning pinyon-juniper, and 37 percent of the treatments where the objective is to reduce hazardous fuels, would occur in Phase I stands. For the entire 3 Bars Project area, about 40 percent of treatments would be in Phase I stands. These treatments would have minimal impact on livestock as there would be little loss of forage that is of value to livestock, and disturbance would be localized.

The remainder of treatments would occur in Phase II and III stands. Livestock use pinyon-juniper for shelter and cover, but generally avoid Phase III stands because of the limited forage and dense cover of pinyon-juniper. Several thousand acres could be treated annually in Phase II and III stands, primarily by using prescribed fire. Prescribed fire could reduce the suitability of the treatment site to support livestock by removing native forbs and grasses. Fires could also lead to the spread of noxious weeds and other invasive non-native vegetation and loss of forage (USDOI BLM 2007c:4-100). Treatment areas would be closed to livestock for a minimum of 2 growing seasons. Based on past monitoring of prescribed fire treatment sites on the 3 Bars Project area, native vegetation should recover within a few years and establishment and spread of noxious weeds and other invasive non-native vegetation should be minimal (USDOI BLM 2011e, f).

Thirteen miles of perennial stream treatments are associated with pinyon-juniper management projects. Treatments could result in increased sediment loads into streams. The effects of treatments on water quality, and possibly on livestock use, would be short-term in duration, with water quality returning to pre-disturbance conditions within several days or weeks after treatment is completed.

Beneficial Effects

Manual and mechanical treatments would improve forage availability and quality for livestock. In pinyon-juniper treatment areas, livestock would benefit from the thinning and burning of pinyon-juniper, as these treatments would encourage growth of the native forbs and grasses favored by livestock and help to move the associated ecological sites toward their Potential Natural Community.

The BLM proposes to remove pinyon-juniper in several drainages on Roberts Mountains that serve as travel corridors for Greater sage-grouse. By removing pinyon-juniper in these drainages and encouraging the establishment of grasses and forbs, the BLM would provide forage for livestock in areas once dominated by pinyon-juniper, and may facilitate livestock movements between valley and mountain use areas. Removal of pinyon-juniper near streams and springs could lead to increased flows and improved water supply for livestock.

In many cases, prescribed fire would benefit livestock by reducing the cover of shrub and tree species, such as pinyon-juniper, which can form dense stands that preclude the establishment of desirable forage species and create physical obstructions to forage. The effect of fire on forage would vary by site. Prescribed burning conducted during the dormant season, under moist conditions, would be likely to stimulate forage production (e.g., through increasing soil temperature and nutrient availability) and favor perennial grasses with greater palatability (USDOI BLM 2007c:4-96).

Treatments that reduce the risk of future catastrophic wildfire through fuels reduction would also benefit livestock. Uncontrolled, high intensity wildfires can damage large tracts of rangeland, reducing its suitability for livestock grazing. Treatments that restore and maintain fire-adapted ecosystems, such as the appropriate use of mechanical thinning and fire, would decrease the effects of wildfire on rangeland plant communities and improve ecosystem resilience and sustainability (USDOI BLM 2007c:4-96). Manual and mechanical treatments would also be used to create many miles of fire and fuel breaks in all management types to help minimize wildfire effects and limit the spread of wildfire.

Sagebrush Treatments

About two-thirds of treatments would occur in the Roberts Mountain, Grass Valley, and JD allotments (**Table 3-52**). Sagebrush communities over most of the area are not meeting their Potential Natural Community objectives primarily due to an inadequate perennial grass and forb understory.

The BLM would thin pinyon-juniper in sagebrush communities on the Table Mountain (Roberts Mountain Allotment), Three Corners (JD and Roberts Mountain allotments), and Whistler Sage (Romano Allotment) units. These treatments would remove encroaching pinyon-juniper and promote sagebrush development.

The BLM would conduct treatments to remove non-native vegetation, including cheatgrass, crested wheatgrass, and forage kochia, using all treatment methods. Rocky Hills Unit treatments would be associated with the Grass Valley (5,477 acres) and JD (3,698 acres) allotments. Whistler Sage treatments would mostly be associated with the Romano Allotment; a few acres would be associated with the Shannon Station Allotment. All but about 5 of the 1,958 acres of treatments associated with West Simpson Park would be on the Grass Valley Allotment.

Adverse Effects

Effects from manual and mechanical treatments would be associated with loss of forage and disturbance. On the Rocky Hills Unit, the BLM would remove crested wheatgrass and forage kochia and re-seed or re-plant the area with sagebrush. This would result in the loss of forage for livestock, and may require that the BLM temporarily suspend AUMs during the treatment.

Beneficial Effects

By thinning pinyon-juniper, and removing non-native vegetation and seeding and planting with native vegetation, perennial forbs and grasses would be able to achieve proper abundance, distribution, and diversity and ecological sites would begin moving towards their Potential Natural Community. This would improve overall rangeland health and provide greater quantity and quality forage vegetation for livestock.

Approximately 5 miles of perennial stream are associated with riparian management projects that occur within the larger sagebrush management area (Lower Henderson 1 and 3 and Lower Vinini Creek units). These treatments would improve water availability and quality for livestock; treatments in riparian zones are discussed under Riparian Treatments. Another 1.3 miles of perennial stream habitat are associated exclusively with sagebrush management projects—Rocky Hills (Coils Creek) and West Simpson Park (unnamed) units. The primary treatment objectives for these units are to thin pinyon-juniper to promote understory development, using manual and mechanical methods, and to remove non-native vegetation. Manual and mechanical treatments would help to improve water flows and water quality to the benefit of livestock.

Noxious weeds and other invasive non-native vegetation infestations can greatly reduce the land's carrying capacity for livestock, which tend to avoid noxious weeds and other invasive non-native vegetation that have low palatability as a result of defenses such as spines and/or distasteful compounds (e.g., thistles; Olson 1999). Grazing can help to manage invasive plants (i.e. cheatgrass), but would have to be used in combination with other methods, such as discing and plowing, to control noxious weeds and other invasive non-native vegetation and to return vegetation to a more desirable composition.

In some treatment areas, the BLM would plant sagebrush seedlings and reseed with native grasses and forbs to encourage the establishment of sagebrush and herbaceous vegetation that would provide forage for livestock. The BLM would use native seeds and plants whenever possible, but could also use non-native plants such as crested wheatgrass and forage kochia. Crested wheatgrass provides forage for livestock, especially during winter (Ogle 2006). Non-native plantings would be limited to those areas where there is cheatgrass dominance, and where the site could be restored in the future with native vegetation.

Treatments that reduce the risk of future catastrophic wildfire through fuels reduction, including removal of noxious weeds and other invasive non-native vegetation, would benefit livestock. Uncontrolled, high intensity wildfires can damage large tracts of rangeland, reducing its suitability for grazing. Manual and mechanical treatments would be used to create many miles of fire and fuel breaks in all management types to help minimize wildfire effects and limit the spread of wildfire.

3.18.3.3.3 Direct and Indirect Effects under Alternative B (No Fire Use Alternative)

Under Alternative B, the BLM would not be able to use prescribed fire or wildland fire for resource benefit. As a result, the BLM anticipates treating about half as many acres under Alternative B as under Alternative A. The types and magnitude of effects for manual, mechanical, and biological control treatments would be similar between Alternatives A and B. Because the BLM would not be able to use fire, there would be none of the adverse effects associated with fire. In particular, there would be no loss of forage, degradation of water quality from soil erosion, and spread of noxious weeds and other invasive non-native vegetation in burned areas. By not using fire, permittees would likely have more flexibility in managing their herds as treatment areas would generally be smaller. Many treatments would take longer to complete, such as those where pinyon-juniper and noxious weeds and other invasive non-native species are controlled using mechanical or manual treatments instead of fire, or where stream channel and riparian habitat restoration are proposed.

The BLM would closely coordinate activities with permittees, and permittees may have to adjust their livestock stocking levels or pasture use. Because some treatments may take longer to complete, such as those where invasive species are controlled using mechanical treatments, the time that permittees would have to adjust their grazing plans could be longer than under Alternative A.

Acres and types of wetland and riparian habitat treated would be similar to Alternative A, and the BLM could use small, temporary exclosure fencing to protect treatment areas. However, less effort would be spent by the BLM on slowing pinyon-juniper encroachment into sagebrush and riparian communities, reducing the amount of Phase II and III pinyon-juniper treated, reducing the amount of habitat restored where sagebrush should occur based on ecological site descriptions, desired state, or management objective, and reducing the acres of habitat treated to improve species diversity, especially through cheatgrass control. Thus, there would be fewer gains in forage production outside of riparian zones, and greater risk of habitat loss from catastrophic wildfire, under this alternative than under Alternative A.

Because fire would not be available to reduce hazardous fuel loads, Alternative B may pose a greater long-term risk for wildfire due to the accumulation of fuels. The BLM would not be able to promote more fire resilient and diverse habitat on the 3 Bars Project area.

Under Alternative B, the BLM would improve forage and water quantity and quality and the health and resiliency of vegetation. The BLM would also make substantial gains in improving forage and water quantity and quality in riparian zones. The BLM would only treat a limited acreage to control noxious weeds and other invasive non-native vegetation, and reduce the risk of catastrophic wildfire. Thus, overall benefits to livestock from treatment actions would be less under this alternative than under Alternative A.

3.18.3.3.4 Direct and Indirect Effects under Alternative C (Minimal Land Disturbance Alternative)

Under Alternative C, the BLM would only be able to use manual and classical biological control methods to treat vegetation. As a result, the BLM anticipates treating about one-fourth the acreage that would be treated under Alternative A. The types and magnitude of effects for manual treatments would be similar to those for the other action alternatives. The consequences of not using fire under Alternative C would be the same as those discussed under Alternative B.

Under Alternative C, many treatments would take longer to complete, such as those where pinyon-juniper and noxious weeds and other invasive non-native species are controlled using manual treatments instead of fire and mechanical methods, or where stream channel and riparian habitat restoration are proposed. Thus, the time that permittees would have to adjust their grazing plans could be longer than under Alternative A.

Although fewer acres would be treated under Alternative C than under Alternatives A and B, the BLM would still have to closely coordinate activities with permittees and permittees may have to adjust their livestock stocking levels or pasture use. The BLM has not identified areas where it would use classical biological control, but if nematodes, insects, or fungi are used on the 3 Bars Project area, treatments would generally be small in size and effects would be localized, or if used on cheatgrass, could cover large areas of habitat. The BLM would not be able to use livestock to remove cheatgrass under Alternative C.

Most of the treatments under this alternative would be to thin and remove pinyon-juniper using chainsaws where it is encroaching into riparian, aspen, and sagebrush habitats. Noise and other disturbance would be less with manual methods than the other methods. Because land disturbance would be greater using mechanical methods and fire than it would be with manual and classical biological control methods, adverse effects to livestock drinking water quality from soil erosion, and loss of non-target vegetation, would be less under this alternative than under Alternatives A and B.

By not being able to use mechanical equipment, however, the BLM would also not be able to conduct stream engineering and restoration, except on a limited basis on only a few stream miles; control noxious weeds and other invasive non-native vegetation, except on very small areas where this vegetation can be hand pulled or controlled using hand tools; reseed and replant restoration sites, except for small areas where shrubs and other vegetation would be planted by hand; remove vegetation to stimulate production of desirable forbs and grasses; or create fire and fuel breaks to reduce the risk of fire spread, except near existing roads or aspen stands, or along a few miles of stream. As a result, there would be less improvement in forage and water quantity and quality, and more risk of catastrophic wildfire than under the other action alternatives. Overall benefits to livestock from treatment actions would be less under this alternative than under Alternatives A and B. By not using fire and mechanical methods, however,

permittees would likely have more flexibility in management of their herds as treatment areas would generally be smaller under this alternative than under Alternatives A and B.

3.18.3.3.5 Direct and Indirect Effects under Alternative D (No Action Alternative)

There would be no direct effects to livestock from 3 Bars Project treatments as no treatments would be authorized under this alternative. The BLM would not create fire and fuel breaks; thin and remove pinyon-juniper to promote healthy, diverse stands; thin and remove pinyon-juniper to promote growth of forbs and grasses; or restore fire as an integral part of the ecosystem. Without treatments to reduce fuel loading or to control cheatgrass establishment and spread, the risk of catastrophic wildfires would continue to increase and such fires could potentially lead to a catastrophic loss of livestock forage and create additional opportunities for noxious weeds and other invasive non-native species to invade newly burned areas. The BLM would not conduct stream engineering and riparian habitat enhancement, and thus would do little to improve water availability and quality for livestock. Thus, this alternative would do little to return the 3 Bars ecosystem to its Potential Natural Community and improve rangeland conditions for livestock.

3.18.3.4 Cumulative Effects

The CESA for livestock and rangeland management is approximately 1,312,942 acres and includes the area encompassed by all of the allotments that are contained within or partially overlap the 3 Bars Project area boundary (**Figure 3-1**)). Approximately 94 percent of the area is administered by the BLM and 6 percent is privately owned. Past and present actions that have influenced livestock in the 3 Bars ecosystem are discussed in Section 3.3.2.3.3.

3.18.3.4.1 Cumulative Effects under Alternative A (Preferred Alternative)

According to utilization data, about 6 percent of the 3 Bars Project area is experiencing moderate to severe forage utilization (see Section 3.18.2.3). However, about 35 percent of proposed riparian zone treatment areas, 25 percent of pinyon-juniper treatment areas, and 48 percent of sagebrush treatment areas are experiencing moderate to severe forage utilization. About 1,600 acres within the Simpson Park Northeast Unit are experiencing moderate to severe forage utilization, although only about 150 acres would be treated within this unit. In addition, livestock often congregate near streams, springs, and wetlands, impacting riparian habitat, forage, and stream channels and their ability to function properly.

The BLM would continue ongoing management reviews to ensure proper livestock management and long-term success of the treatments. If changes in the current terms and conditions of the grazing permit are required, they would be implemented through a separate process in accordance the grazing regulations.

The BLM would also continue to conduct wild horse gathers, conduct AML reviews and adjustments, remove excess animals and use fertility control, and implement habitat projects.

The BLM may install small, temporary exclosure fencing to exclude livestock and wild horses from treatment areas, although water gaps may be incorporated into fencing along streams to allow access to water. These actions should help to improve water quality in affected streams, restore streams to Proper Functioning Condition, and improve riparian habitat.

Land development, mineral development, and oil, gas, and hydrothermal exploration and development could affect about 15,000 acres in the CESA in the reasonably foreseeable future, including the Mount Hope Project, and acreage

associated with potential land sales (although it is unlikely that all of this land would be developed), materials sites, roads, and rights-of-way for roads, pipelines, and power and telephone lines. Disturbance associated with these activities could alter livestock behavior and habitat use, and loss of native plant communities in the affected areas could reduce forage for livestock and facilitate the establishment and spread of noxious weeds and other invasive non-native vegetation.

A total of 32 AUMs in the Romano and Roberts Mountain allotments would be lost in perpetuity as a result of the 734-acre Mount Hope Project open pit. In addition, 490 AUMs in the Roberts Mountain Allotment, and 291 AUMs in the Romano Allotment, would be lost for approximately 70 years as a result of an exclusionary perimeter fence that would enclose 14,206 acres of the Mount Hope Project. The loss of AUMs represents 5 percent of the active grazing preference in the Roberts Mountain Allotment and 10 percent of the active grazing preference in the Romano Allotment.

As described in the Mount Hope Project EIS, when an area of BLM-administered land is devoted to a single public purpose, such as mineral production, AUMs are adjusted to reflect the area withdrawn from multiple uses. These AUMs are lost until such time that mining has ceased and reclamation has been successfully completed. At that time, the area would be evaluated to determine if the AUMs can be returned (USDOI BLM 2012b:3-421 to 3-422).

In addition to the loss of access to forage for the Mount Hope Project, mine project activities could result in direct impacts to the movement patterns of livestock. Noise disturbance, human presence, and increased vehicular traffic would be continuous for approximately 44 years during implementation and execution of the mine project. Sudden loud noises, such as blasts, could cause livestock to disperse in directions away from the sound.

Of particular concern is the potential drawdown of groundwater near the proposed Mount Hope Project and its effects on forage, particularly phreatophytes, and on water resources on Roberts Mountains and in the Kobeh Valley. The mine project could have a significant impact on groundwater resources and could result in diminished surface water flows on Roberts Mountains, to the detriment of livestock grazing (USDOI BLM 2012b:3-423 to 3-424).

As part of mitigation for the mine project, the mine proponent worked with the BLM to develop alternative water sources. Six locations have been identified in coordination with the BLM and would be developed as water sources for wild horses and could also be used by wildlife and livestock in areas historically used by wild horses. These sites consist of existing stock wells that are not currently functioning or do not have pumps or troughs and two new sources tapped from Mount Hope Project production wells. These sources would provide water where it has not been available previously or where availability has been limited (USDOI BLM 2012b:3-439). The mine proponent would reclaim disturbed areas during and after mining, and remove the fence after reclamation is completed. The reclaimed land would have more grass and forb forage and less shrub and pinyon-juniper cover than presently occurs. The BLM would also monitor vegetation conditions in areas that could be impacted by lower groundwater levels, and conduct seeding, with possible grazing closures, to minimize the loss of forage (USDOI BLM 2012b:3-424). The BLM felt that these actions would mitigate impacts from the mine project to less than significant. There would be no actions taken to provide alternative forage for livestock during the 70 year development, operation, and reclamation period.

Although herbicides are not proposed for use as part of the 3 Bars Project, the BLM could use herbicides applied aerially and using ground-based methods under existing authorizations. Thus, there could be risks to livestock in the CESA from being accidentally sprayed, or ingesting, herbicides that could adversely impact livestock health, although only a few hundred acres would be treated annually. Given the amount of acreage treated, noxious weeds and other invasive non-native vegetation would continue to spread to the detriment of livestock forage. Five herbicides are

typically used on the 3 Bars Project area—2,4-D, glyphosate, imazapyr, metsulfuron methyl, and picloram. The BLM may also use imazapic to treat cheatgrass on the project area in the future. These herbicides, along with 12 other herbicides that could be used by the BLM, generally have negligible to low risks to livestock at typical and maximum application rates. A more detailed discussion of the effects of herbicides on livestock is in the 17-States PEIS (USDOI BLM 2007b:4-125).

Catastrophic wildfire can burn extensive vegetation, particularly during drought conditions when soil and vegetation are dry. Treatments should reduce the incidence and severity of wildfires. An estimated 84,000 acres would burn within the 3 Bars Project area within the next 20 years, and would result in loss of livestock forage and degradation of water quality.

The BLM would treat about 127,000 acres in the 3 Bars Project area, and an additional 15,000 acres under existing and reasonably foreseeable future authorizations, over the next 10 to 15 years within the CESA, or about 11 percent of the CESA. Short-term, there would be disturbance to and loss of vegetation, particularly pinyon-juniper, and there could be an increase in noxious weeds and other invasive non-native vegetation, from treatments.

Long-term, these treatments should result in vegetation that is healthier, more fire resilient, abundant, and diverse, and similar to the Potential Natural Community. The BLM would conduct stream bioengineering and plantings on about 31 miles of stream to slow stream flow and create pools and wet meadows, and to improve wetland and riparian vegetation and water flows and quality. In addition, the BLM would thin and remove pinyon-juniper and noxious weed and other invasive non-native vegetation, and create fire and fuel breaks to reduce the risk of catastrophic wildfire and its spread. These beneficial effects would help to offset some of the adverse effects to livestock from other reasonably foreseeable future actions in the CESA.

3.18.3.4.2 Cumulative Effects under Alternative B (No Fire Use Alternative)

Under Alternative B, effects from non-3 Bars Project reasonably foreseeable future actions on livestock would be similar to those described under Alternative A. Under Alternative B, less effort would be spent by the BLM on treatments to reduce wildfire risk and its impacts on livestock forage and water quality, including use of fire to restore natural fire regimes, within the 3 Bars Project area. However, by not using fire on the 3 Bars Project area, there would be no risks to vegetation from fire on several thousand acres annually within the 3 Bars Project area. However, fire could be used on other portions of the CESA outside the 3 Bars Project treatment areas.

Under this alternative, the BLM would be limited to hand pulling, discing, plowing, seeding, and using livestock to control noxious weeds and other invasive non-native vegetation on several hundred acres annually on the 3 Bars Project area. These methods could result in soil disturbance, but would also give the BLM some control over the types and amount of vegetation that are removed. The West Simpson Park Unit is on rugged terrain, and use of mechanical equipment to control cheatgrass would be difficult on this unit.

Hazardous fuels reduction and habitat improvement projects could occur on about 63,000 acres within the 3 Bars Project area, and on an additional 15,000 acres within the CESA, or about 6 percent of the CESA. Overall, there would be a net beneficial accumulation of effects from BLM treatments long-term that would help to offset adverse effects to livestock from other reasonably foreseeable future actions, but not to the same extent as would occur under Alternative A.

3.18.3.4.3 Cumulative Effects under Alternative C (Minimal Land Disturbance Alternative)

Under Alternative C, effects from non-3 Bars Project reasonably foreseeable future actions on livestock would be similar to those described under Alternative A. Under Alternative C, the BLM would only be able to use manual and classical biological control methods to treat vegetation, and would treat only a fourth of the acreage that could be treated under Alternative A, within the 3 Bars Project area. However, fire and mechanized equipment would be used in other portions of the CESA to improve habitat, remove hazardous fuels, and reduce the risk of wildfire.

By not being able to use mechanical methods, fire, and livestock to reduce hazardous fuels, create fire and fuel breaks, and remove downed wood and slash, the risk of wildfire and its impacts on vegetation and water used by livestock would likely increase on the 3 Bars Project area.

Hazardous fuels reduction and habitat improvement projects would occur on about 32,000 acres within the 3 Bars Project area, and on an additional 15,000 acres within the CESA, or about 4 percent of the acreage within the CESA. Overall, there would be a net beneficial accumulation of effects from BLM treatments long-term that would help to offset adverse effects to livestock from other reasonably foreseeable future actions, but not to the extent as would occur under Alternatives A and B.

3.18.3.4.4 Cumulative Effects under Alternative D (No Action Alternative)

Under Alternative D, effects from non-3 Bars Project reasonably foreseeable future actions on livestock would be similar to those described under Alternative A. There would be no cumulative effects on livestock from 3 Bars Project treatments as no treatments would be authorized under this alternative. The BLM could create fire and fuel breaks; thin and remove pinyon-juniper to promote healthy, diverse stands; slow the spread of noxious weeds and other invasive non-native vegetation using ground-based and aerial herbicide application methods; restore fire as an integral part of the ecosystem; and reduce the risk of a large-scale wildfire under current and reasonably foreseeable future authorized actions, but on a limited acreage through existing and subsequent separate decisions.

Based on historic treatments in the 3 Bars Project area, only about 1,500 acres would be treated annually in the CESA to reduce hazardous fuel levels and improve ecosystem health. Hazardous fuel levels would likely increase, and only a limited number of miles of fuel and fire breaks would be constructed under this alternative compared to the action alternatives. The BLM would conduct stream bioengineering and riparian habitat enhancements on only a limited area. Thus, water quality would remain degraded and water availability could be limited, especially during droughts, for livestock. The trend toward large-sized wildfires of moderate to high severity in sagebrush and large stand-replacing wildfires in pinyon-juniper would likely increase. BLM treatments would help to offset some of the effects to livestock from non-3 Bars Project actions, but not to the same extent as would occur under the action alternatives.

3.18.3.5 Unavoidable Adverse Effects

The proposed treatments could temporarily affect non-target vegetation that might provide forage, shelter, or other life requisites for livestock.

3.18.3.6 Relationship between the Local Short-term Uses and Maintenance and Enhancement of Long-term Productivity

The proposed vegetation treatments would affect the availability and palatability of vegetation over the short-term. These impacts would begin to disappear within 1 to 2 growing seasons after treatment.

All treatments that successfully reduce the cover of noxious weeds and other invasive non-native vegetation and restore native vegetation would benefit livestock by increasing the quality of forage. In addition, treatments would remove some noxious weeds (e.g., tansy ragwort, houndstongue, Russian knapweed, and common St. Johnswort) that are harmful to livestock. The success of noxious weeds and other invasive non-native vegetation removal, and restoration of native habitats, would determine the level of benefit of the treatments over the long-term.

Treatments that reduce the risk of future catastrophic wildfire through fuels reduction would also benefit livestock. Uncontrolled, high intensity wildfires can remove forage from large tracts of rangeland, reducing its suitability for livestock in the short-term. Treatments that restore and maintain fire-adapted ecosystems through the appropriate use of mechanical thinning, fire, and other vegetation treatment methods would decrease the effects of wildfire on rangeland plant communities and improve ecosystem resilience and sustainability (USDOI BLM 2007b:4-249).

3.18.3.7 Irreversible and Irretrievable Commitment of Resources

Loss in vegetation function and quality from treatments would have a short-term impact on livestock productivity. Although some livestock could be displaced from public lands, forage could be found elsewhere, although possibly at a higher cost. As rangelands improved, their ability to support livestock use levels at or near current levels should also improve. Although this impact would represent an irreversible loss of the individual animal, the impacts to the livestock operation and industry would be reversible (USDOI BLM 2007b:4-252).

3.18.3.8 Significance of the Effects under the Alternatives

None of the 3 Bars Project alternatives should result in significant direct or indirect long-term loss of habitat, forage, or water, and these effects would not result in a significant cumulative effect. Treatments would have short-term effects on these forage and water resources needed by livestock. However, there would be long-term improvement in forage and water resources under all alternatives from the treatments.

3.18.4 Mitigation

According to utilization data, 33 percent of proposed treatment occur within areas experiencing moderate to severe forage utilization. Those areas are discussed in Section 3.18.3. Utilization data were collected on the Flynn Parman, Roberts Mountain, JD, Three Bars, Romano, and Lucky C allotments during October to December 2010 and May to July 2011, encompassing about 71 percent of the 3 Bars Project area. Data for other allotments, however, were collected during the 1990's and early 2000's, so current forage utilization may differ from past forage utilization, especially for areas that have not been surveyed for several decades. In addition, forage utilization accounts for both livestock and wild horse use.

In order to ensure treatment success and prior to treatment implementation, monitoring would be conducted to determine if proper livestock management is in place. If modification to the terms and conditions of a grazing permit are required, they would be implemented through a decision process separate from the 3 Bars Project and in accordance with the grazing regulations. Additionally, if the BLM determines that wild horses are over AML within seeding treatments, AML will be achieved prior to project implementation. Since treatments may be conducted several years from now, the BLM would not only use rangeland health data collected to date, but would also evaluate rangeland conditions at the time of treatment.

3.18.4.1 Potential Changes to Grazing Permits Prior to Treatment Implementation

1. The season of use may be modified to avoid hot season grazing (July – September).

2. The duration of grazing may be shortened to allow the riparian vegetation time to recover.

3. Average stubble height of at least 4 inches will be maintained for herbaceous riparian vegetation. If stubble height limits are reached, the permittee will have 5 days to move livestock to the next pasture in the rotation or from the allotment entirely.

4. Streambank alteration rates would be set to a level appropriate to the particular stream in accordance with Guidelines for Establishing Allowable Levels of Streambank Alteration (Cowley 2002). Based on the characteristics of the streams and the presence of Lahontan cutthroat trout, the streambank alteration rates would range from 10 to 20 percent. If designated streambank alteration rates are reached, the permittee will have 5 days to move livestock to the next pasture in the rotation or from the allotment entirely.

5. Utilization of woody species will not exceed 35 percent. If utilization rates are reached, the permittee will have 5 days to move livestock to the next pasture in the rotation or from the allotment entirely (Wyman et al. 2006).

6. Existing non-functioning water developments and fences may be required to be repaired if contributing to unacceptable use patterns by livestock.

7. Temporary fences may be constructed to exclude grazing within the treatment area for a minimum of two growing seasons or until treatment objectives are obtained. Additionally, livestock closure may be required for the fenced area(s) or other treatment areas. If a livestock closure is required, it would be implemented through a decision process separate from the 3 Bars Project and in accordance with the grazing regulations.

8. The season of use within aspen treatments may be shifted to late season (beginning of September; Jones 2010).

9. Utilization of terminal leader browse on aspen branches and suckers will be less than or equal to 20 percent. If utilization rates are reached, the permittee will have 5 days to move livestock to the next pasture in the rotation or from the allotment entirely.

10. For mountain big sagebrush communities, utilization will not exceed 45 percent on upland herbaceous species and 35 percent on upland shrub species. If utilization rates are reached, the permittee will have 5 days to move livestock to the next pasture in the rotation or from the allotment entirely as outlined in *Range Management, Principles and Practices* (Holechek et al. 1998).

11. For Wyoming and basin big sagebrush communities, utilization will not exceed 35 percent on upland herbaceous species and 35 percent on upland shrub species. If utilization rates are reached, the permittee will have 5 days to move livestock to the next pasture in the rotation or from the allotment entirely as outlined in Holechek et al. (1998).

12. For black sagebrush communities, utilization will not exceed 45 percent on upland herbaceous species and 35 percent on upland shrub species. If utilization rates are reached, the permittee will have 5 days to move livestock to the next pasture in the rotation or from the allotment entirely as outlined in Holechek et al. (1998).

3.19 Visual Resources

3.19.1 Regulatory Framework

Scenic quality is the measure of the visual appeal of a unit of land. Section 102 (a) of the Federal Land Policy and Management Act (1976), states that "...the public lands are to be managed in a manner that will protect the quality of scientific, scenic, historical, ecological, environmental, air and atmospheric, water resource, and archeological values." Section 103(c) identifies "scenic values" as one of the resources for which public land should be managed. Section 201(a) states that "the Secretary shall prepare and maintain on a continuing basis an inventory of all public lands and their resources and other values (including scenic values)..." Section 505(a) requires that "each ROW [rights-of-way] shall contain terms and conditions which will...minimize damage to the scenic and esthetic values..."

Section 101 (b) of the NEPA requires that measures be taken to ensure that aesthetically pleasing surroundings be retained for all Americans. Under the Federal Land Policy and Management Act, the BLM developed a standard visual assessment methodology, known as the Visual Resource Management (VRM) system, to inventory and manage scenic values on lands under its jurisdiction. Guidelines for applying the VRM system on BLM lands are described in the BLM Manual 8400, *Visual Resource Management* (USDOI BLM 1984b) and BLM Handbook H-8410-1 *Visual Resource Inventory* (USDOI BLM 1986b).

3.19.2 Affected Environment

Visual resources consist of land, water, vegetation, wildlife, and other natural or built features visible to recreation visitors, adjacent landowners, and travelers on public lands. In addition, roads, streams, and trails pass through a variety of characteristic landscapes where natural attractions can be seen and where cultural modifications are apparent. Of particular importance to visual resources in this region is the visual appeal (health and spatial diversity) of streams and ponds, and riparian, wetland, aspen, and sagebrush landscapes.

3.19.2.1 Study Methods and Study Area

The assessment of visual resources on the project area was based on a 2011 visual resource inventory (VRI) conducted for the Battle Mountain District, including the 3 Bars Project area (OTAK 2011). A follow-up site visit was made to the 3 Bars Project area to confirm OTAKS's (2011) findings.

The analysis area for the assessment of direct and indirect effects to visual resources is the 3 Bars Project area, while the CESA includes the 3 Bars Project area and the BLM visual resource management background distance zone (15 miles; **Figure 3-1**).

3.19.2.2 Visual Resource Inventory and Management

The characteristic landscape of the project area is contained within a variety of landforms in the central Great Basin of the Basin and Range physiographic province. Visual resources within the project area are influenced by topographic,

vegetative, geologic, hydrologic, and land use characteristics. The topography ranges from relatively flat terrain and low rolling or flat-topped and cone-shaped hills to steep mountain ranges. Vegetation is comprised of grasses, greasewood, rabbitbrush, and sagebrush at lower elevations, and trees and shrubs including aspen, mountain mahogany, limber pine, and pinyon-juniper at higher elevations. Vegetation patterns affect color, form, line, and contrast, which shape the basis for the analysis of visual resources in the project area. Land use in the area is predominantly grazing and recreation. There is little surface water in the area except for a few perennial and intermittent streams and a few small ponds. The excellent air quality in the region promotes expansive views. The success and appeal of recreational activities such as hiking, collecting, photography, wildlife viewing, and picnicking are dependent on the settings and scenic views.

The BLM identifies and evaluates visual resource values through the VRI system (USDOI BLM 1986b). Visual resource inventory classes are based on scenic quality, sensitivity level, and distance zone criteria and indicate the overall value of landscapes. A VRI was conducted to determine the visual values of the Battle Mountain District, including the 3 Bars Project area. The components of a VRI include scenic quality evaluation, sensitivity level analysis, visibility, and distance zones.

For the scenic quality evaluation, lands are rated as Class A (19 points or more), Class B (12 to 18 points), or Class C (11 points or less). Lands are rated using seven key factors: landforms, vegetation, water, color, influence of adjacent scenery, scarcity and cultural modifications. Approximately 37 percent of the 3 Bars Project area is rated as Class A, and includes the mountainous areas of the project area, and 60 percent as Class B (**Table 3-53**). **Figure 3-45** illustrates the scenic quality classifications in the project area.

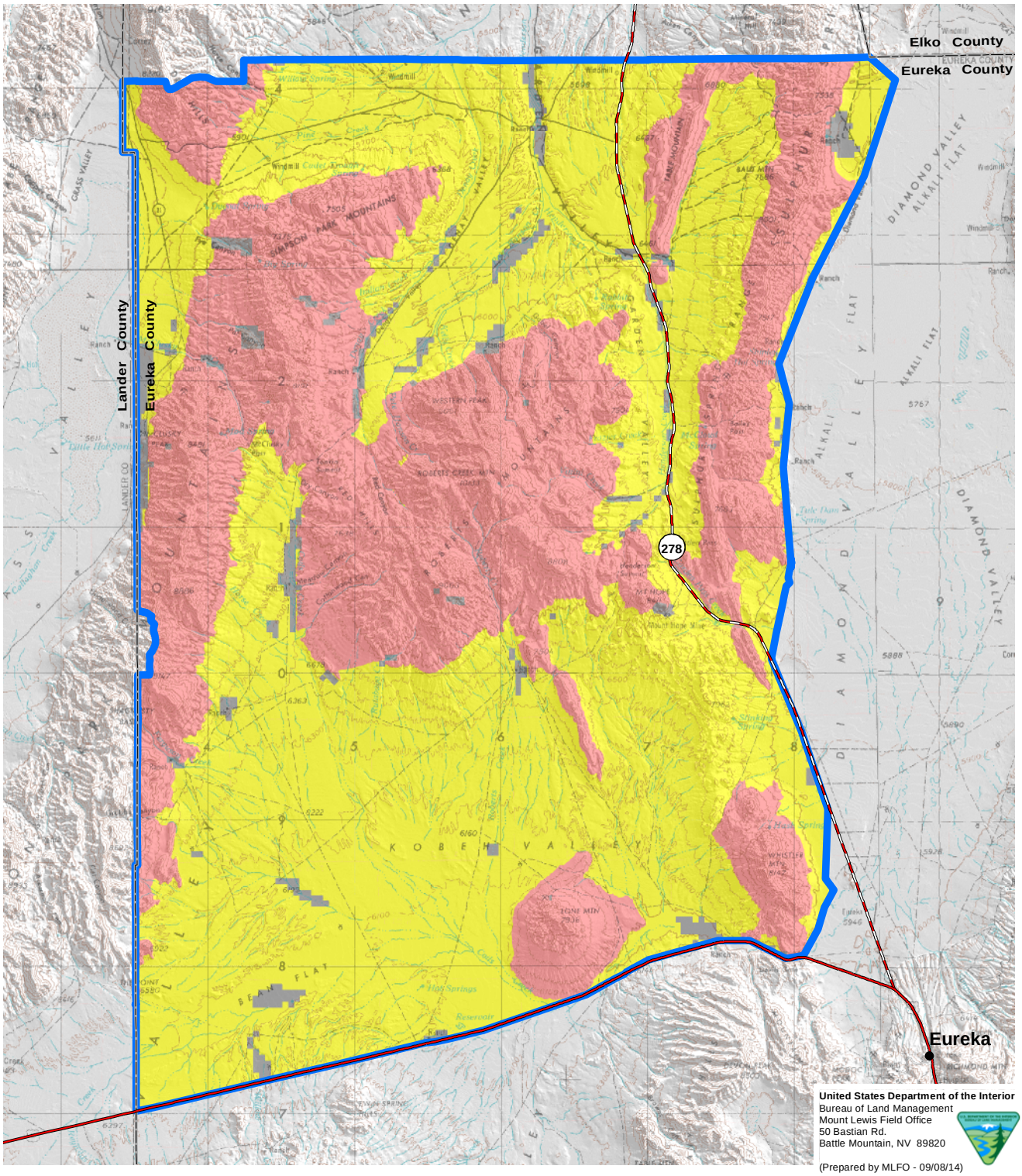
The sensitivity level analysis measures public concern for visual resources. Lands are assigned high, medium, or low sensitivity levels based on consideration of the following factors: types of users, amount of use, public interest, adjacent land uses, special areas, and other factors. Approximately 45 percent of the 3 Bars Project area is rated High, and includes much of the southern half of the project area, 30 percent is rated Moderate, and 22 percent is rated Low (**Table 3-53**). **Figure 3-46** illustrates the sensitivity levels for the sensitivity level rating units in the project area.

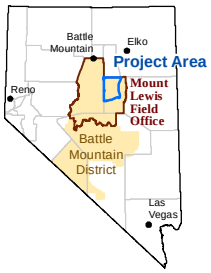
Distance zones are delineated to subdivide the landscape based on relative visibility from travel routes, use areas, or vantage points. The three distance zones include:

- Foreground-middleground Zone: this is the area visible within 3 to 5 miles of the viewing location.
- Background Zone: this is the visible area beyond the foreground-middleground zone, but usually within 15 miles of the viewing location.
- Seldom Seen Zone: These are areas that are rarely visible within the foreground-middleground or background zones.

Approximately 88 percent of the 3 Bars Project area is visible in the foreground-middleground, and 9 percent is seldom seen (**Table 3-53**; **Figure 3-47**). Seldom seen areas include much of Roberts Mountains, and portions of West Simpson Park and Sulphur Spring Range.

The scenic quality evaluation, sensitivity level analysis, and delineation of distance zones are combined to develop VRI classes (**Figure 3-48**), which represent the relative value of the visual resources. Classes I and II are the most valued, Class III represents a moderate value, and Class IV represents the least value. Approximately 64 percent of the 3 Bars Project area is rated Class II and includes most mountainous areas, and the flatter portions of the southern





Legend

Visual Resource Inventory
Scenic Quality Rating

- Class A
- Class B
- Not Inventoried
- 3 Bars Project Area

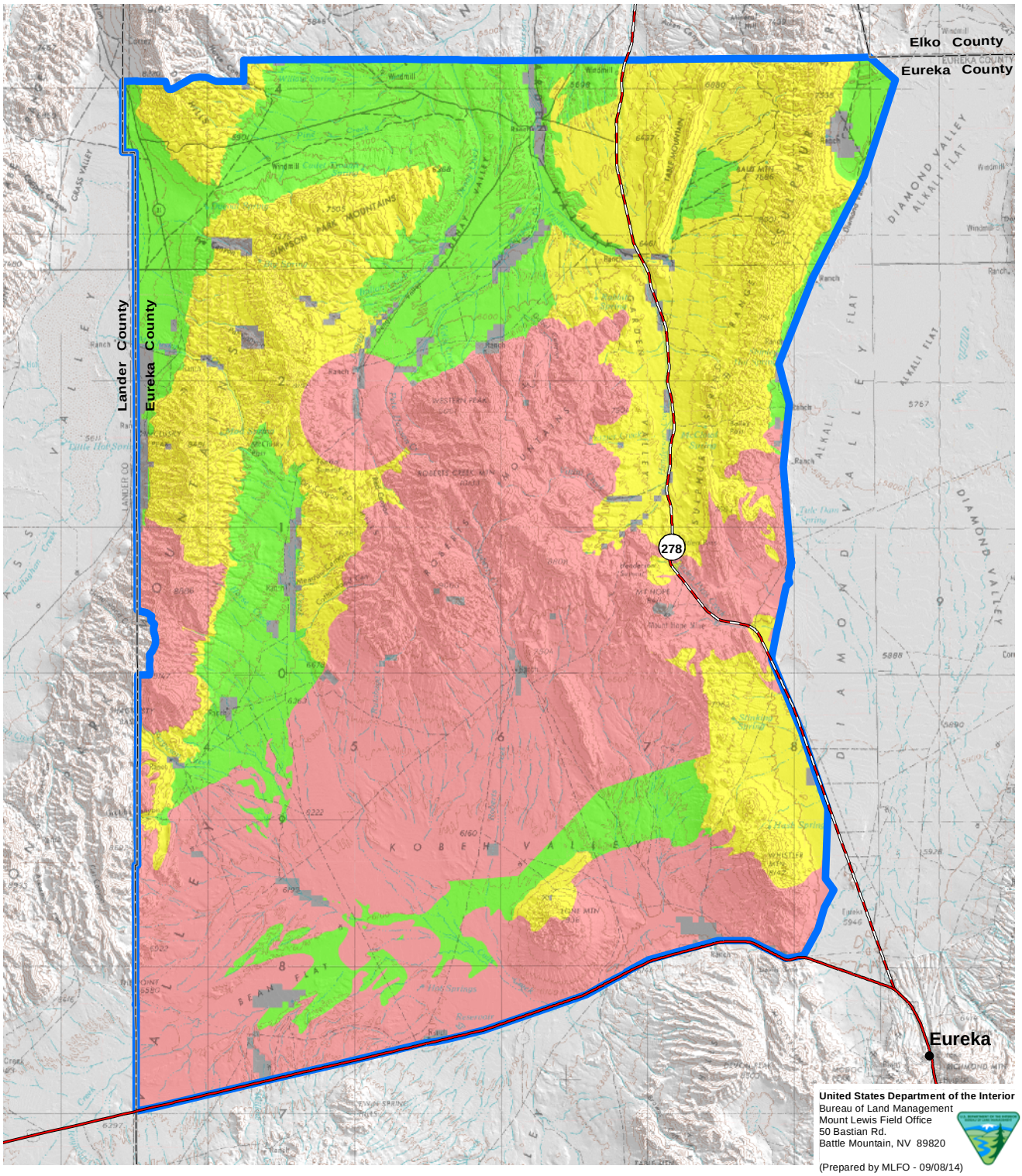
Source: OTAK 2011.

3 Bars Ecosystem and Landscape Restoration Project

Figure 3-45

Visual Resource Inventory
Scenic Quality Rating

0 1 2 3 4 5 10 Miles
0 1 2 3 4 5 10 Kilometers
N



Legend

Visual Resource Inventory Sensitivity Level Rating

- High
- Moderate
- Low
- Not Inventoried
- 3 Bars Project Area

Source: OTAK 2011.

3 Bars Ecosystem and Landscape Restoration Project

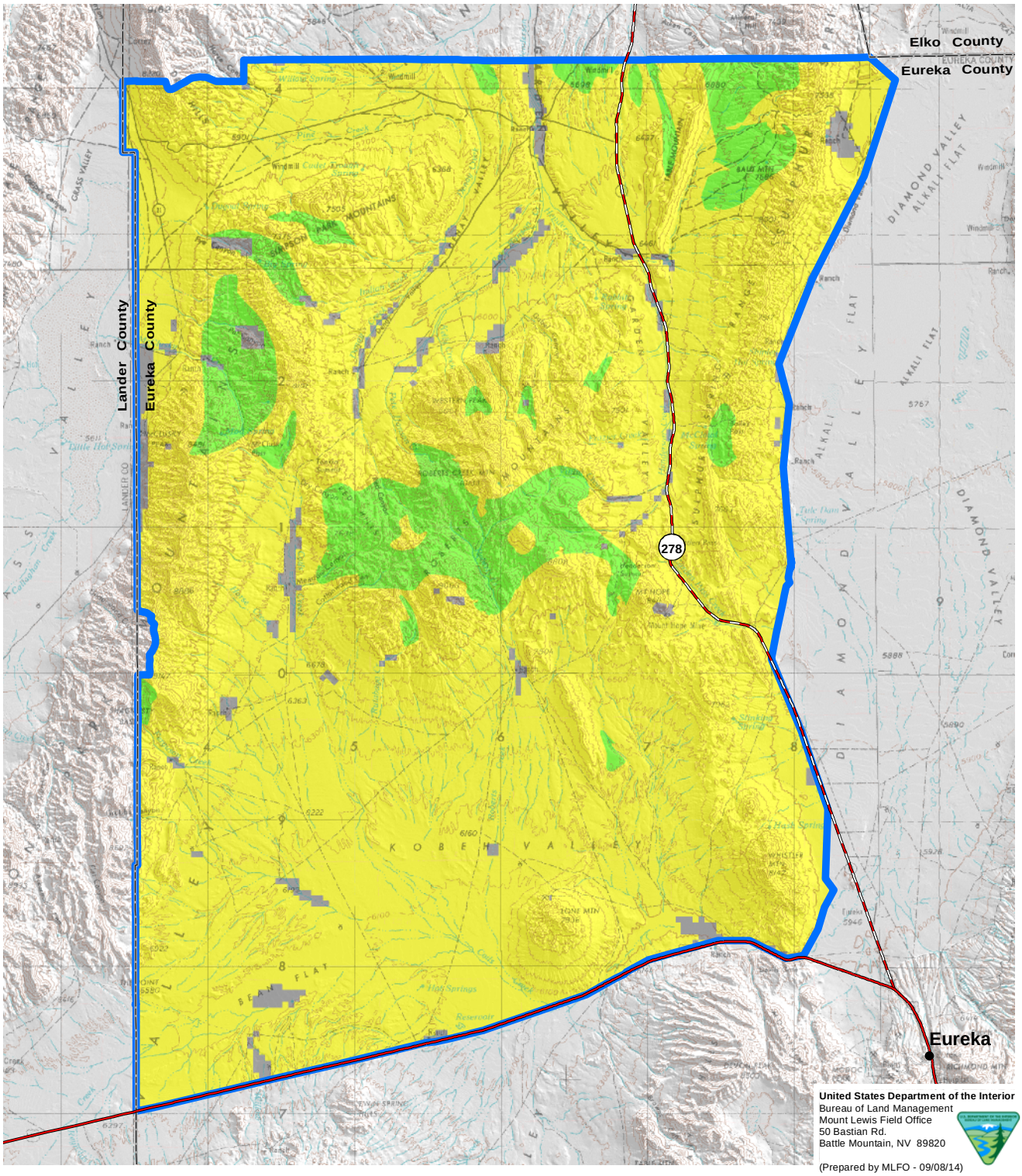
Figure 3-46

Visual Resource Inventory Sensitivity Level Rating

0 1 2 3 4 5 10 Miles

0 1 2 3 4 5 10 Kilometers

N



United States Department of the Interior
Bureau of Land Management
Mount Lewis Field Office
50 Bastian Rd.
Battle Mountain, NV 89820

(Prepared by MLFO - 09/08/14)

Legend

Visual Resource Inventory
Visual Distance Zones

- Foreground-Middleground
- Seldom Seen
- Not Inventoried
- 3 Bars Project Area

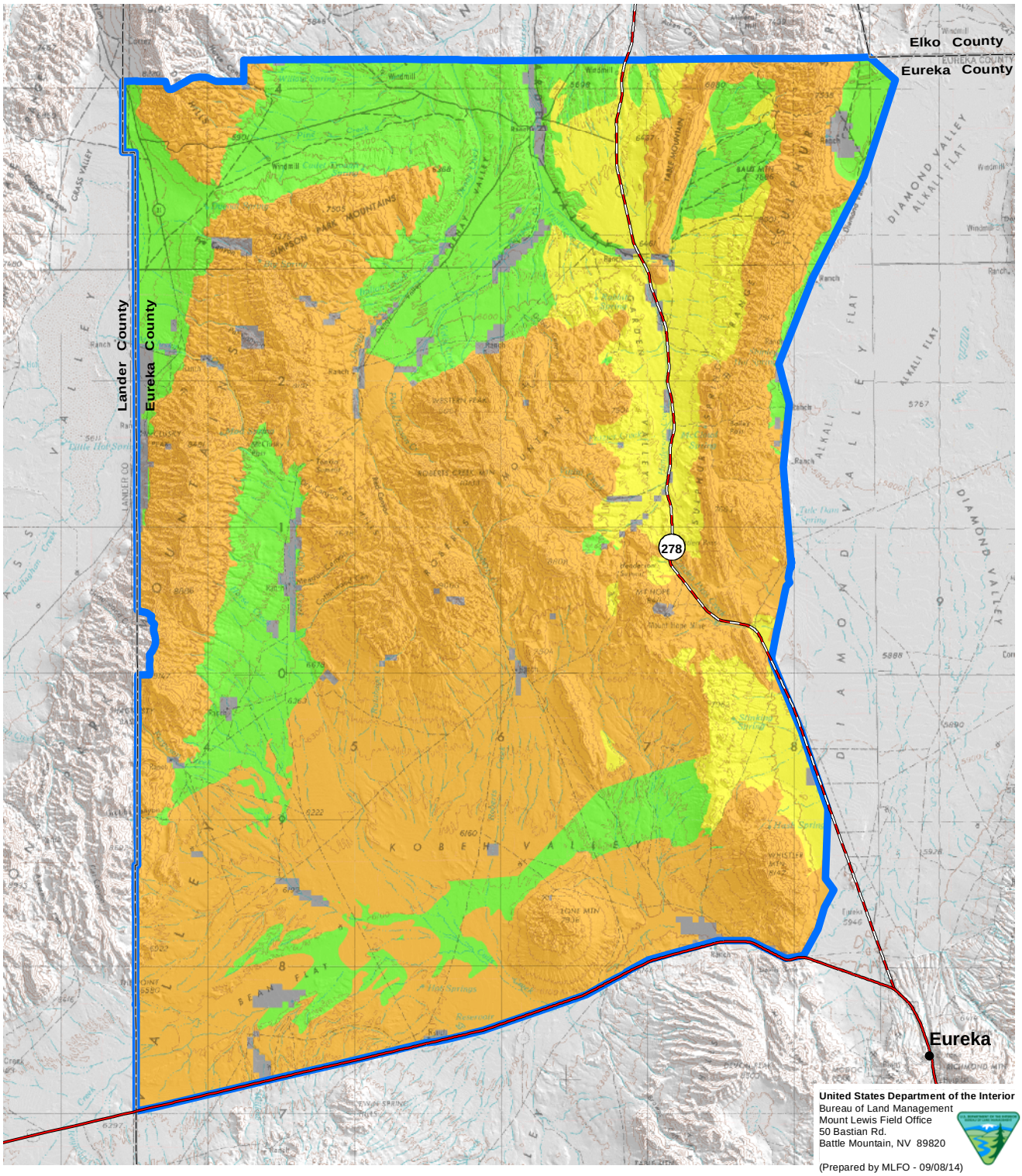
Source: OTAK 2011.

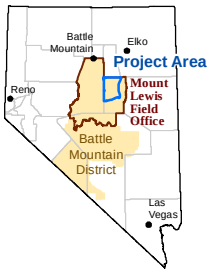
3 Bars Ecosystem and Landscape Restoration Project

Figure 3-47

Visual Resource Inventory
Visual Distance Zones

0 1 2 3 4 5 10 Miles
0 1 2 3 4 5 10 Kilometers
N





Legend

Visual Resource Inventory Classes

- Class II
- Class III
- Class IV
- Not Inventoried
- 3 Bars Project Area

Source: OTAK 2011.

3 Bars Ecosystem and Landscape Restoration Project

Figure 3-48

Visual Resource Inventory Classes

0 1 2 3 4 5 10 Miles
0 1 2 3 4 5 10 Kilometers
N

TABLE 3-53

Visual Resource Project Area Inventory and Visual Resource Management Classes Summary

Scenic Quality Evaluation					
BLM - Class A	**BLM - Class B**	**BLM - Class C**	**Not Inventoried**	**Total**	
279,601 37%[1]	449,395 60%	190 0%	20,624 3%	749,810	
Sensitivity Level Analysis					
High	**Medium**	**Low**	**Not Inventoried**	**Total**	
337,294 45%	227,753 30%	164,138 22%	20,624 3%	749,810	
Distance Zones					
Foreground-Middleground	**Background**	**Seldom Seen**	**Not Inventoried**	**Total**	
660,709 88%	0 0%	68,447 9%	20,624 3%	749,810	
Visual Resource Inventory Classes					
VRI Class I	**VRI Class II**	**VRI Class III**	**VRI Class IV**	**Not Inventoried**	**Total**
0 0%	478,105 64%	78,868 11%	172,213 23%	20,624 3%	749,810
Visual Resource Management Classes					
VRM Class I	**VRM Class II**	**VRM Class III**	**VRM Class IV**	**Not Inventoried**	**Total**
30,073 4%	24,331 3%	45,319 6%	650,086 87%	0 0%	749,810

[1] Percent of acres within 3 Bars Project area.

half of the project area, 11 percent is rated Class III, and 23 percent is rated Class IV; there are no Class I areas on the project area (**Table 3-53**).

Visual resource inventory classes are informational in nature and provide the baseline data for considering visual values in the RMP process. Visual resource inventory classes do not establish management direction and are not used as a basis for constraining or encouraging surface-disturbing activities.

The VRM system is used by the BLM to manage visual resources on public land. Visual resource management objectives are established in RMPs in conformance with land use allocations (USDOI BLM 1984). These area-specific objectives provide the standards for planning, designing, and evaluating future management activities. BLM policy requires that all BLM land be inventoried for scenic values and be assigned a VRM Class during the land use planning process. These VRM classes are part of the land use plan decisions for a particular office and set the management standards for visual resources that activity level plans must subsequently meet. The BLM uses the VRM system to systematically identify and evaluate visual resource values and to determine the appropriate level of scenery management. The VRM process involves 1) identifying scenic values, 2) establishing management objectives for those values through the land use planning process, and 3) designing and evaluating proposed activities to analyze effects and develop mitigation measures to meet the established VRM objectives. Based on this process, the BLM designates lands into one of four VRM classes with the following objectives:

- VRM Class I – The objective of this class is to preserve the existing character of the landscape. This class provides for natural ecological changes; however, it does not preclude very limited management activity. The level of change to the characteristic landscape should be very low and must not attract attention.

- VRM Class II – The objective of this class is to retain the existing character of the landscape. The level of change to the characteristic landscape should be low. Management activities may be seen, but should not attract the attention of the casual observer. Any changes must repeat the basic (design) elements of form, line, color, and texture found in the predominant natural features of the characteristic landscape.

- VRM Class III – The objective of this class is to partially retain the existing character of the landscape. The level of change to the characteristic landscape should be moderate. Management activities may attract attention, but should not dominate the view of the casual observer. Changes should repeat the basic elements found in the predominant natural features of the characteristic landscape.

- VRM Class IV – The objective of this class is to provide for management activities, which require major modification of the existing character of the landscape. The level of change to the characteristic landscape can be high. These management activities may dominate the view and be the major focus of viewer attention. However, every attempt should be made to minimize the impact of these activities through careful location, minimal disturbance, and repeating the basic (design) elements.

The assignment of VRM classes is based on the management decisions made in the RMP process, which must take into consideration the value of visual resources and management priorities for land uses (**Figure 3-49)**. Based on these decisions, approximately 4 percent of the 3 Bars Project area is rated VRM Class I, and includes portions of Roberts Mountains and Simpson Park Mountains, 3 percent is rated Class II, 6 percent is rated Class III, and 87 percent is rated Class IV. During the RMP process, inventory class boundaries can be adjusted as necessary to reflect resource allocation decisions made in the RMP.

Table 3-53 summarizes the acreages and percent of the project area categorized into each VRI component, the resulting VRI classes, and the VRM classes.

3.19.3 Environmental Consequences

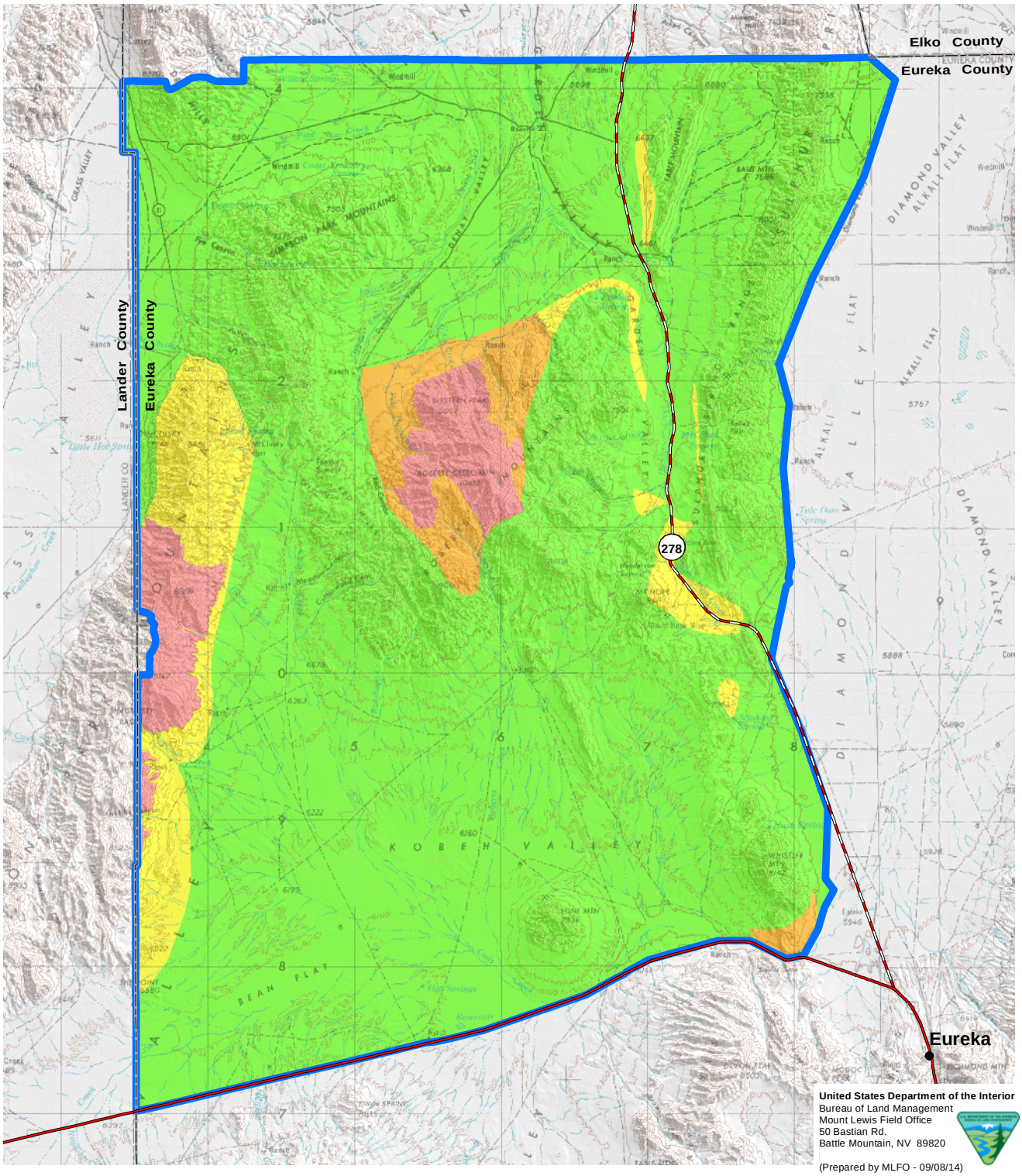
3.19.3.1 Key Issues of Concern Considered during Evaluation of the Environmental Consequences

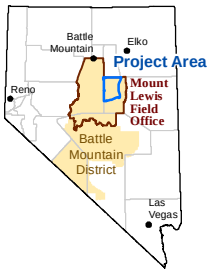
The only visual resources scoping comment indicated concern that the current VRM classes in the Shoshone-Eureka (USDOI BLM 1986a) may be outdated. The RMP is being updated and this analysis for the 3 Bars Project area is based on the VRI conducted by OTAK (2011) for the updated Battle Mountain District RMP.

3.19.3.2 Significance Criteria

Impacts to visual resources would be considered significant if BLM actions resulted in the following:

- Strong visual contrast in the immediate foreground view from a designated recreation site, historic trail, or residence in the long-term (greater than 10 years).





Legend

Visual Resource Management Classes

- Class I
- Class II
- Class III
- Class IV
- 3 Bars Project Area

Source: BLM 2012l.

3 Bars Ecosystem and Landscape Restoration Project

Figure 3-49

Visual Resource Management Classes

0 1 2 3 4 5 10 Miles

0 1 2 3 4 5 10 Kilometers

N

- Non-compliance with VRM objectives in the long-term (greater than 3 years for VRM objectives Classes I and II and greater than 10 years for Classes III and IV).

3.19.3.3 Direct and Indirect Effects

3.19.3.3.1 Direct and Indirect Effects Common to All Action Alternatives

Vegetation treatment activities have the potential to disturb the surface features of the landscape and impact scenic values in the short-term (less than 3 years) and long-term (greater than 10 years). The proposed vegetation treatments would affect visual resources if they changed the scenic quality of the landscape, diminished the experience of viewers with a high level of concern for scenery, or did not meet agency management objectives. In general, treatments would have short-term negative effects and long-term positive effects on visual resources.

Public sensitivity to changes in the landscape character of the area would vary relative to the level of visibility and distance from viewer activity, and viewer concern. Distance zones and impacts to viewers are listed in **Tables 3-54** to **3-56**, respectively. The BLM's VRM policy states that the extent of visual impact and compliance with management objectives must be evaluated at the project level using the visual contrast rating process.

A Contrast Rating System, as described in BLM Manual Handbook H- 8431-1, *Visual Resource Contrast Rating* (USDOI BLM 1986c), provides a systematic means to evaluate the approved VRM objectives, and to identify mitigation measures to minimize adverse visual impacts. The Contrast Rating System is designed to compare the respective features of the existing characteristic landscape with a proposed project and to identify those parts that are not in conformance. These features include the basic design elements of form, line, color, and texture that characterize the landscape. Modifications to a landscape that repeat the natural landscape's basic elements are said to be in harmony with their surroundings, while those that differ may be visually displeasing. The information generated is used to determine the amount of visual contrast created and whether the VRM objective for the area would be met, and to develop additional mitigation measures necessary to meet the VRM objective.

This process compares the amount of contrast to the form, line, color, and texture of the characteristic landscape of an area as a result of a surface-disturbing activity. The effects of vegetation treatments on the visual quality of the landscape would be most notable to travelers, sightseers, and residents situated in the immediate foreground (0.0 to 2 miles) for the first year to approximately 3 years following treatment. Visual impacts over the short- and long-term from vegetative treatments would occur from projects that 1) reduce the scenic quality rating of the treatment site, 2) result in degradation of high-sensitivity visual resources, or 3) are not in compliance with BLM management objectives.

Adverse Effects

In the short-term, removal of vegetation would affect the visual qualities of treatment sites by creating hard-edged openings and other vegetation-free areas that provide a noticeable visual contrast to the surrounding areas. In the short-term, treatments could create visually distinct areas of discolored vegetation (i.e., areas where treatments have killed vegetation), which could contrast markedly from surrounding areas of healthy vegetation. The degree of these effects would depend on the amount of area treated, the appearance of the surrounding vegetation and the vegetation being removed, the type of treatment method used, and the season of treatment. The greater the area and nearness to viewers of the vegetation treatment, the greater the visual impacts are likely to be. The effects of treatments that occur over a large portion of the landscape are more likely to be observed by people than the effects of small-scale treatments (USDOI BLM 2007c:4-112).

TABLE 3-54

Landscape Scenery Impacts

Scenic Quality	Project Visual Contrast		
	Strong	**Moderate**	**Weak**
Class A	High	High	Moderate
Class B	High	Moderate	Low
Class C	Moderate	Low	Low

TABLE 3-55

Distance Zones and Project Visibility

Distances	Project
Immediate Foreground	0 – 2 Miles
Foreground-Middleground	2 – 5 Miles
Background	5 – 15 Miles
Seldom Seen	Greater Than 15 Miles

TABLE 3-56

Impacts to Viewers

Project Visibility	Project Visual Impacts		
	High Sensitivity	**Moderate Sensitivity**	**Low Sensitivity**
0 – 2 Miles	High	Moderate	Low
2 –5 Miles	Moderate	Moderate	Low
5 – 15 Miles	Moderate	Low	Low
Greater Than 15 Miles or Seldom Seen	Low	Low	Low

Color contrasts caused by vegetation removal would be most apparent in areas dominated by homogenous patterns of vegetation and by large plants, such as conifer trees. The visual impacts would be heightened if the treatment also prevented the manifestation of seasonal changes in vegetation, such as spring flowers or fall color. The contrast between a cleared area and the surrounding vegetation would be less in sagebrush, where low-growing shrubs, and browns, grays, and earth tones dominate the landscape than in areas with pinyon-juniper. In addition, the brown colors associated with vegetation treatments would be least noticeable during the late fall and the winter, when they would blend more naturally with surrounding colors, than in the spring and summer, when the green colors of new growth are more likely to be present (USDOI BLM 2007c:4-112).

There would be negligible to weak short-term visual contrasts to the landscape as a result of manual treatments. Treatment limited to small areas (exclosure fencing, removal of small groups of trees) would be much less noticeable

than the alterations caused by other treatment methods. In other cases, such as the removal of vegetation with chainsaws over many acres, the visual effects would be negative, though minor, and would last until downed trees were removed by wood gatherers, pile burned, or concealed through revegetation.

Beneficial Effects

Effects to visual resources would begin to disappear within 1 to 2 growing seasons after treatment. The regrowth of vegetation on the site would eliminate much of the stark appearance of a cleared area, and the area would develop a more natural appearance.

Impacts would last for the longest amount of time in pinyon-juniper stands where large trees and shrubs are removed. Treatments that aim to rehabilitate degraded ecosystems, if successful, would result in plant communities that are dominated by native species. Native-dominated communities tend to be more diverse, and thus, more visually appealing than plant communities that have been overtaken by the surrounding monoculture (such as pinyon-juniper encroaching on riparian zones). Treatments that reduce the risk of wildfire should reduce the visual impacts associated with large expanses of burned vegetation. Additionally, the BLM would work to mitigate the edge effect of treatments by "feathering" treatments in to adjacent vegetation communities and designing treatments in a mosaic pattern.

3.19.3.3.2 Direct and Indirect Effects under Alternative A (Preferred Alternative)

Riparian Treatments

The majority of riparian zone treatment areas are rated Class A for their scenic qualities, have High sensitivity to the public, and are in the foreground-middleground zone. Approximately 75 percent of treatment areas are VRM Class III or IV, where moderate to substantial modification of the landscape is acceptable. The remaining 25 percent of the proposed treatment areas includes 9 acres of Roberts Creek, which are VRM Class I, where the objective is to preserve the existing character of the site, and 444 acres of VRM Class II at Roberts Creek, Vinini Creek, and Willow Creek, where a low level of change in the landscape character is acceptable. The three Class I/II areas are part of the Roberts Creek Unit group.

Adverse Effects

Riparian zone treatments along Roberts, Vinini, and Willow Creeks would result in a low level of change, and portions of these streams that are rated VRM Class I or II may not be treated. For example, the Roberts Creek Unit is 1,390 acres, but only 9 acres are VRM Class I; 486 acres are Class II, where a low level of change is acceptable. Nearly all of the Willow and Upper Willow Creek units are VRM Class II. Stream channel restoration would be limited to about 250 acres and a mile or two of stream annually. Use of manual and mechanical treatments to reconstruct streams and clear vegetation would be likely to remove large quantities of vegetation from a treatment site, leaving dead plant material on the ground to turn brown, and expose much soil.

Although treatment activities could be seen, they would probably not attract the attention of the casual observer as they are in somewhat secluded drainages, and would be conducted to retain or restore the natural character of the landscape.

Beneficial Effects

Riparian management treatments would focus on restoring streams that have been degraded and on slowing pinyon-juniper encroachment into riparian zones. Mechanical methods would result in strong short-term visual contrasts of form, line, color, and texture until the treatment site is revegetated. For all treatment methods, effects to visual resources would begin to disappear within 1 to 2 growing seasons after treatment. The regrowth of vegetation on the site would eliminate much of the stark appearance of a cleared area, and the area would develop a more natural appearance. Non-fire treatments can be used to avoid the visual effects associated with smoke and to integrate treated and untreated areas into a more visually appealing mosaic of vegetation types. Effects would last for the longest amount of time in woodlands and other areas where large trees and shrubs were removed.

Over the long-term, vegetation treatments would likely improve visual resources on public lands. Treatments that aim to rehabilitate degraded ecosystems, if successful, would result in plant communities that are dominated by native species. Native-dominated communities tend to be more visually appealing than areas that have been overtaken by noxious weeds and other invasive non-native vegetation, or that have been invaded by pinyon-juniper. These treatment benefits could be more noticeable in the riparian zone, as many of the treatment streams have been substantially degraded and are not meeting Proper Functioning Condition.

Treatments that restore native fire regimes, vegetation, and ecosystem processes would reduce the spread of noxious weeds and other invasive non-native vegetation that is less visually appealing than native vegetation. Noxious weeds and other invasive non-native vegetation removal, stream channel restoration, and the removal of encroaching pinyon-juniper would help to limit the spread of wildfire by enabling riparian zones to function as fuel breaks.

Aspen Treatments

The scenic quality evaluation showed that all aspen treatment units were rated Class A. The visual effects to resources from treatments would be High on all treatment units. However, only about one-third of the treatment units would be visible in the foreground-middleground (JD-A1, JD-A4, RM-A7, and RM-A9); the remaining areas would seldom be seen. Based on these assessments, all riparian management units are rated Class II.

About 40 percent of treatment acreage is rated VRM Class I, and includes the JD-A4, RM-A2, RM-A10, and SFF-A1 units. About 20 percent of acres are rated VRM Class II (JD-A1 and RM-A2), while the remaining acres are VRM Class IV, including 2 acres of RM-A2. At the JD-A4, RM-A2, and RM-A10 units, manual and mechanical methods would be used to remove pinyon-juniper trees encroaching into aspen habitats. For JD-A1, treatments would focus on treating aspen to stimulate stand suckering using mechanical and manual methods, while at SFF-A1 the BLM would erect small, temporary exclosure fencing around an aspen stand to promote sucker survival. Exclosure fencing could also be used at other sites to protect treated aspen stands from grazing.

Only about 5 acres of treatments would be visible to the public annually, thus effects of aspen treatments on the visual resources of the 3 Bars Project area would be negligible.

Pinyon-juniper Treatments

The scenic quality evaluation found that about 65 percent of treatment areas were rated Class A, and 35 percent as Class B. Treatment units where over 90 percent of the area was Class A included Birch Creek, Cottonwood/Meadow Canyon, Dry Canyon, Lone Mountain, Upper Pete Hanson, Tonkin North, and Tonkin South units.

Public concern for adverse visual effects to resources would be Low on about 6 percent of treatment areas, but about 47 percent each for Moderate and High. Treatment units where most acreage (over 75 percent) was rated High are the Atlas, Birch Creek, Upper Pete Hanson, Three Bars Ranch, Tonkin South, and Upper Roberts Creek units.

Nearly 90 percent of treatment areas would be visible in the foreground-middleground, while the remaining areas would be seldom seen. Only the Upper Pete Hanson and Upper Roberts Creek units would be relatively difficult to see by the public.

Despite the relatively high resource ratings given above, over 90 percent of the pinyon-juniper management area was rated as VRM Class IV, where substantial modification of the landscape is appropriate, while 2 percent of treatment acres were rated Class III, and 7 percent as Class II. Units with more than 100 acres rated as Class II were the Atlas, Gable, Lower Pete Hanson, Upper Pete Hanson, Upper Roberts Creek, and Whistler units, although these acres were only a small portion of the overall treatment acres except for Lower Pete Hanson and Upper Roberts, where VRM Class II lands comprised over 75 percent of the treatment unit. Only 346 acres were rated VRM Class I, and these were at the Birch Creek, Upper Pete Hanson, and a small portion (20 acres) of Upper Roberts Creek units.

Adverse Effects

Most visual resource concerns would be focused on the Birch Creek, Upper Pete Hanson, and Upper Roberts Creek units, since most of their acreage is rated VRM Class I or II. Treatments on the Upper Pete Hanson and Upper Roberts Creek units, however, would be relatively difficult for the public to see. The BLM proposes to improve sagebrush habitat by thinning pinyon-juniper to promote sagebrush growth, and create fuel breaks to reduce the damage from a wildfire. Manual and mechanical methods and prescribed fire would be used on Upper Roberts Creek, while only chainsaws would be used on the Birch Creek and Upper Pete Hanson units because treatment areas are in the Roberts Mountains WSA. The effects of manual treatments are discussed under Effects Common to All Alternatives.

Most of the pinyon-juniper on the Upper Roberts Creek Unit would be removed from Phase I stands. Because these trees have encroached into sagebrush habitat, and are widely-spaced throughout the area, removal of these trees would restore the visual character associated with sagebrush habitat and would have a minor visual effect. Limited management is allowed in VRM Class I areas, and management activities should not attract the attention of the casual observer in VRM Class II areas. The Birch Creek and Upper Pete Hanson units are small (less than 300 acres each) and manual treatments would be used to remove pinyon-juniper in all phases. If trees are removed from dense stands, there could be more visual contrast with remaining areas, but this effect would be minor because only about 20 acres would be treated annually in each unit and the BLM would manage pinyon-juniper stands to create a mosaic of habitat for wildlife.

Prescribed fire could be used on the Upper Roberts Creek Unit. Although smoke would be visible to the public on the Upper Roberts Creek Unit, charred vegetation from burning would be difficult for the public to see as this unit is relatively isolated and not visible from the foreground-middleground.

The objective of VRM Classes I and II is to retain the existing character of the landscape. Although treatments for these three units would be limited in scope and extent, they would alter the existing characters of the landscape. However, treatments would help remove encroaching pinyon-juniper and return the sites to their more historic condition.

Beneficial Effects

Beneficial treatment effects on visual resources would be similar to those discussed under Effects Common to All Alternatives, and under Riparian Treatments. Treatments in VRM Class I and II areas would help to slow pinyon-juniper encroachment into sagebrush habitat and restore more natural conditions to these areas. Treatments on Birch Creek and Upper Peter Hanson would help to retain the visual characteristics associated with the Roberts Mountains WSA.

Treatments on other pinyon-juniper management units would also benefit visual resources on the 3 Bars Project area. Treatments that restore degraded ecosystems would result in plant communities that are dominated by native species and are more visually appealing. Prescribed fire would help to remove dead and diseased pinyon-juniper that is unattractive; reduce hazardous fuels and the risk of catastrophic wildfire; and restore native fire regimes, vegetation, and ecosystem processes. The use of prescribed fire would allow the BLM to limit the size and duration of fires in areas of high public use to minimize visual contrasts between burned and unburned vegetation and effects of smoke, and to conduct fires during the cooler times of the year when visitation by the public would be less. By using all treatment methods to reduce hazardous fuels, create fire and fuel breaks, remove noxious weeds and other invasive non-native vegetation, and promote more resilient vegetation, the BLM would reduce the risk of wildfire and its inherent impacts on the scenery.

Sagebrush Treatments

Mechanical methods have the potential to scarify the landscape and leave bare soil and dead vegetation that contrast with the surrounding colors. The effects of mechanical treatments on visual resources would be temporary, and would only last until the re-establishment of vegetation on the treatment site, typically 1 or 2 growing seasons (USDOI BLM 2007c:4-113).

The scenic quality evaluation found that about 15 percent of treatment areas were rated as Class A, while the remainder were rated Class B. On the Three Corners and West Simpson Park units, over 95 percent of the acreage is rated Class A.

Public concern for adverse visual effects to resources would be High on about 20 percent of the sagebrush treatment area, Moderate on 35 percent of the area, and Low on 45 percent of the area. On the Coils Creek, Nichols, Roberts Mountain Pasture, and Three Corners units, more than 80 percent of the treatment acres were rated High.

Based on the visibility of sites, all but about 1,000 acres would be visible in the foreground-middleground. Only the Three Corners Unit would be seldom seen by the public. None of the sagebrush treatment acreage was rated VRM Class I, and less than 1 percent was rated VRM Class II. Over 90 percent of the acreage is VRM Class IV, while 8 percent is Class III. Class II acreage is found at the Alpha and Three Corners units.

Adverse Effects

Concerns regarding effects from sagebrush management would be greatest for the Alpha, Coils Creek, Nichols, Roberts Mountain Pasture, Three Corners, and West Simpson Park units. The Alpha, Coils Creek, Nichols, and Roberts Mountain Pasture units are part of the Alpha Unit treatment group. The effects of manual and mechanical treatments on relatively flat terrain, such as for these sagebrush communities, would have less effect on visual resources than treatments on steeper terrain, such as pinyon-juniper woodlands, which would be more visible on the

landscape. The effects of manual and mechanical treatments on visual resources would be temporary, and would only last until the reestablishment of vegetation on the treatment site, typically 1 or 2 growing seasons.

On the Three Corners Unit, the BLM would thin pinyon-juniper and seed and plant to increase the percent composition of native grasses, forbs, and shrubs to 50 to 75 percent of the Potential Natural Community. The Three Corners Unit is found in an area that is seldom seen by the public.

The BLM would treat cheatgrass on south-facing slopes to promote the establishment of sagebrush on the West Simpson Park Unit. Portions of this unit have been burned by wildfire in recent years. The BLM would use all methods to control cheatgrass, including pre-treatments using prescribed fire, livestock, and discing. About 1,963 acres, or half of the unit, could be treated over the life of the project. The greater the area of vegetation treatment, the greater the visual effect is likely to be. Large treatments alter a larger portion of the landscape than small treatments, and the effects are more likely to be observed by people. However, the West Simpson Park Unit consists of degraded lands of low to moderate scenic quality, resulting in a smaller visual effect from treatment and likely an improvement in the scenic quality of the land over the long-term.

Beneficial Effects

Beneficial effects from manual, mechanical, and fire treatments are discussed under Effects Common to All Alternatives and Pinyon-juniper Treatments.

In general, treatments on the West Simpson Park Unit would have long-term positive effects on visual resources. Areas dominated by non-native vegetation have been impacted by past wildfires and are some of the more degraded areas on the 3 Bars Project area. They are also vulnerable to future wildfires. Thus, efforts to restore native, fire resilient vegetation would make these areas more visually appealing, and would reduce the risk of future wildfires.

The controlled use of domestic animals to contain undesirable vegetation may create a short-term visual impact associated with trampling and consumption of vegetation. These impacts would be dealt with on a case-by-case basis and mitigated as appropriate at the project level. The visual effects caused by the containment of domestic animals would be short-term in nature and would create a positive visual effect with the regrowth of desirable vegetation in a healthy, productive condition.

3.19.3.3.3 Direct and Indirect Effects under Alternative B (No Fire Use Alternative)

The types and magnitude of effects for manual, mechanical, and biological control treatments would be similar between Alternatives A and B. Treatments conducted under Alternative B would have short-term adverse and long-term beneficial impacts on the scenic qualities of the landscape on about 2,500 to 3,500 acres annually on lands with a Scenic Quality rating of A and Sensitivity Level Rating of High. Of the estimated 6,350 acres treated annually under Alternative B, about 5,500 acres could occur where treatments occur would be visible to the public. The BLM may have to modify management objectives on about 20 acres of VRM Class I, and 35 acres in VRM Class II treatment units annually, as these areas could be visible to the casual observer.

Without the use of fire, there would be no localized deterioration of air quality and reduced visibility caused by smoke, no blackened appearance of treated areas and blackened stumps and snags that would create a color contrast, and no spread of noxious weeds and other invasive non-native vegetation in burned areas. However, long-term improvements in pinyon-juniper stand health, replacement of pinyon-juniper stands with sagebrush, forbs, and grasses, and removal of encroaching pinyon-juniper using prescribed fire and wildland fire for resource benefit, and

the resultant improvement in the visual qualities of the landscape, would not occur over several thousand acres annually.

Without the use of fire to reduce hazardous fuel loads, Alternative B could pose a greater long-term risk for wildfire due to the accumulation of fuels. The BLM would not be able to promote more fire resilient and diverse habitat on the 3 Bars Project area. The BLM would also not be able to use prescribed fire to remove downed wood and other hazardous fuels associated with thinning and removal of pinyon-juniper, thus increasing the risk of wildfire in pinyon-juniper treatment areas. An increase in wildfire risk compared to Alternative A could lead to a long-term reduction in the visual qualities of the landscape.

The BLM could use classical biological control, such as the use of nematodes, insects, and fungi to control non-native vegetation, but would more likely use cattle and goats. The use of domestic animals to contain undesirable vegetation would cause minimal effects to visual resources. The sight of domestic animals should not cause any adverse effects, as livestock are found over most of the 3 Bars Project area.

Under Alternative B, the BLM would be able to slow, but probably not reverse, habitat degradation on the 3 Bars Project area. Treatments would occur across the landscape and most projects would benefit multiple resources, but large-scale fire and herbicide treatments would not occur under this alternative. Although short-term impacts to visual resources would be less under this alternative than Alternative A, there would be less long-term improvement in the scenic quality of the 3 Bars Project area under Alternative B compared to Alternative A.

3.19.3.3.4 Direct and Indirect Effects under Alternative C (Minimal Land Disturbance Alternative)

Treatments conducted under Alternative C would have short-term adverse and long-term beneficial impacts on the scenic qualities of the landscape on about 1,500 to 2,000 acres annually of lands with a Scenic Quality Rating of A and Sensitivity Level Rating of High. Of the estimated 3,250 treated annually under Alternative C, about 3,000 acres would be visible to the public. The BLM may have to modify management objectives on about 10 acres of VRM Class I and 15 acres in VRM Class II treatment lands annually, as these areas could be visible to the casual observer.

By not being able to use mechanical equipment, there would be no adverse visual effects associated with stream channel restoration disturbance, creating openings in pinyon-juniper stands from removal of vegetation, creating long linear features for fire and fuel breaks, or causing surface disturbance from discing/tilling/harrowing to restore areas invaded by cheatgrass. The BLM would also leave less dead plant material on the ground to turn brown.

The BLM has not identified areas where it would use classical biological control, but if nematodes, insects, or fungi are used on the 3 Bars Project area, they would cause some visual alterations to the landscape. Plants attacked by these agents often show visual symptoms of disease or parasitism, which are often regarded as visually unappealing. However, these changes would only be noticeable upon close examination of the site. The overall appearance of the treatment area would likely remain relatively unchanged. Because these agents kill target species gradually, the effects would be less visibly distinct than treatments that kill a large area of vegetation all at once (USDOI BLM 2007c:4-113).

Under Alternative C, the BLM would not be able to conduct stream engineering and restoration to improve native riparian habitat, except on a limited basis on only a few stream miles; control noxious weeds and other invasive non-native vegetation, except on very small areas where this vegetation can be hand pulled or controlled using hand tools; reseed and replant restoration sites, except for small areas where shrubs and other vegetation would be planted by hand; or create fire and fuel breaks to reduce the risk of wildfire spread, except near existing roads or aspen stands, or

along a few miles of stream. The BLM would only be able conduct hazardous fuels treatments and remove downed woody material from treatments on a limited acreage using manual and classical biological control treatments. Thus, the risk of catastrophic wildfire, and its effects on the visual landscape, would be greater under Alternative C than the other action alternatives.

Under Alternative C, the BLM would not substantially improve the native vegetation community nor stop the loss of important ecosystem components. As a result, there would be less improvement in the visual quality of the 3 Bars Project area under this alternative than under Alternatives A and B.

3.19.3.3.5 Direct and Indirect Effects under Alternative D (No Action Alternative)

There would be no direct effects to visual resources from 3 Bars Project treatments as no treatments would be authorized under this alternative. The BLM would not create fire and fuel breaks; thin and remove pinyon-juniper to promote healthy, diverse stands; use fencing to protect treatment areas; or restore fire as an integral part of the ecosystem. Without treatments to reduce fuel loading or to control cheatgrass establishment and spread, the risk of catastrophic wildfires would continue to increase. The BLM would not conduct stream engineering and riparian habitat enhancement, and thus would do little to improve visual qualities within riparian zones. This alternative would also do little to return the 3 Bars ecosystem to its Potential Natural Community and restore Proper Functioning Condition to wetlands and riparian zones, to the benefit of visual resources on the project area.

3.19.3.4 Cumulative Effects

The CESA for visual resources is approximately 2,599,851 acres and includes the 3 Bars Project area and the BLM visual resource management background distance zone (15 miles; **Figure 3-1**). Approximately 94 percent of the area is administered by the BLM and 6 percent is privately owned. Past and present actions that have influenced visual resources in the 3 Bars ecosystem are discussed in Section 3.3.2.3.3.

Table 3-57 summarizes the acreages and percent of the cumulative effects analysis area categorized into each VRI component, the resulting VRI classes, and the VRM classes.

3.19.3.4.1 Cumulative Effects under Alternative A (Preferred Alternative)

As demonstrated by rangeland health studies conducted for the 3 Bars Project, historic livestock grazing and other natural and human-caused factors have resulted in rangelands dominated by early- to mid-seral vegetation, indicating a need to improve the health and resiliency of native vegetation and move rangelands closer to their Potential Natural Community. In addition, livestock and wild horses often congregate near streams, springs, and wetlands, causing impacts to riparian habitat, forage, and stream channels and their ability to function properly.

To improve forage and water resources, the BLM would continue ongoing management reviews to ensure proper livestock management and the long-term success of the proposed treatments. Any required modifications to grazing permits would be completed through a decision process separate from the 3 Bars Project and in accordance with the grazing regulations.

The BLM would also continue to conduct wild horse gathers, AML reviews and adjustments, remove excess animals and use fertility control, improve water developments, and implement habitat projects. These management actions would help to improve visual resources on the 3 Bars Project area.

TABLE 3-57

Visual Resource Project Area Inventory and Visual Resource Management Classes Summary for Cumulative Effects Study Area

Scenic Quality Evaluation					
BLM - Class A	**BLM - Class B**	**BLM - Class C**	**Not Inventoried**	**Total**	
836,562[1] 32%[2]	1,107,651 43%	443,199 17%	212,438 8%	2,599,851	
Sensitivity Level Analysis					
High	**Medium**	**Low**	**Not Inventoried**	**Total**	
867,129 33%	681,443 26%	838,841 32%	212,438 8%	2,599,851	
Distance Zones					
Foreground-Middleground	**Background**	**Seldom Seen**	**Not Inventoried**	**Total**	
1,766,368 68%	71,917 3%	549,127 21%	212,438 8%	2,599,851	
Visual Resource Inventory Classes					
VRI Class I	**VRI Class II**	**VRI Class III**	**VRI Class IV**	**Not Inventoried**	**Total**
0	1,254,385 48%	167,253 6%	965,775 37%	212,438 8%	2,599,851
Visual Resource Management Classes					
VRM Class I	**VRM Class II**	**VRM Class III**	**VRM Class IV**	**Not Inventoried**	**Total**
64,545 2%	40,426 2%	334,999 13%	2,058,732 79%	101,150 4%	2,599,851

[1] Acres.

[2] Percent of acres within CESA.

The BLM would continue to use ground-based herbicide applications to remove noxious weeds and other invasive non-native vegetation, and aerial-based herbicide applications to remove cheatgrass, and would also use herbicides to restore burned areas under the Burned Area Emergency Stabilization and Rehabilitation program, under existing authorizations on about 1,000 acres annually. The BLM could use aerial applications to control cheatgrass on several hundred acres annually on the West Simpson Park Unit. Portions of this unit have been burned by wildfire in recent years. About half of the unit could be treated over the life of the project. In general, herbicide treatments would have short-term negative effects and long-term positive effects on visual resources. The greater the area of vegetation treatment, the greater the visual effect is likely to be. Large treatments alter a larger portion of the landscape than small treatments, and the effects are more likely to be observed by people. However, the units consists of degraded lands of low to moderate scenic quality, resulting in a smaller visual effect from treatment and likely an improvement in the scenic quality of the land over the long-term.

Land development, mineral development, and oil, gas, and hydrothermal exploration and development could affect about 10,000 acres in the CESA in the reasonably foreseeable future, including the Mount Hope Project and acreage associated with potential land sales (although it is unlikely that all of this land would be developed), materials sites and other mineral development, roads, and rights-of-ways for roads, pipelines, and power and telephone lines.

The Mount Hope Project would disturb about 8,300 acres. There would be a moderate to strong contrast in form, line, and color between the existing landscape and the post-mining landscape associated with the Mount Hope Project. Most of the area encompassed by the mine project is VRM Class IV and the changes in the landscape would conform to VRM objectives. Visual contrast would be reduced by reclamation practices, which would consist of recontouring and revegetating the waste rock and tailings storage facilities; recontouring and revegetating exploration roads; removing all buildings, structures, and equipment brought to the site; and recontouring and revegetating all building sites. Following successful reclamation, the visual contrast from the Mount Hope Project would be slightly reduced. Over the long-term, the vegetation used to restore the mine site would begin to blend with the color and texture of the existing natural landscape. However, the mine pit would still be visible to the public after mine reclamation and its visual impact on the landscape would be significant (USDOI BLM 2012b:3-327 to 3-328).

Catastrophic wildfire can burn extensive areas of vegetation. Based on acreage burned by wildfires since 1985, an estimated 140,000 acres would be burned by wildfires in the CESA during the next 20 years, and would result in a blackened landscape.

Proposed hazardous fuels reduction and habitat improvement treatments would occur on about 127,000 for the 3 Bars Project, and on about 15,000 acres in other portions of the CESA under current and reasonably foreseeable future authorizations, or collectively about 5 percent of the CESA. Proposed treatments would move vegetation communities in areas that have been disturbed by past natural and human-caused action in the CESA toward their Potential Natural Communities. As discussed under direct and indirect effects, proposed vegetation treatments would have a short-term affect on visual resources by changing the scenic quality of the landscape. Long-term, the 3 Bars Project should result in vegetation that is more fire resilient, diverse, and similar to the Potential Natural Community. Hazardous fuels treatments would remove vegetation that contributes to short return-interval fires and loss of native vegetation. These treatments would help to reduce the risk of wildfire within the CESA. In addition, the BLM would conduct stream bioengineering and plantings on about 31 miles of stream to slow stream flow and create pools and wet meadows to improve wetland and riparian vegetation. These activities would help to make the landscape more visually appealing. In the long-term, benefits to visual resources from treatments would help to offset some of the adverse effects to visual resources from other reasonably foreseeable future projects in the CESA, and to a greater extent than would occur under the other alternatives.

3.19.3.4.2 Cumulative Effects under Alternative B (No Fire Use Alternative)

Under Alternative B, effects from non-3 Bars Project reasonably foreseeable future actions on visual resources would be similar to those described under Alternative A. Under Alternative B, less effort would be spent by the BLM on treatments to reduce wildfire risk and its impacts on visual resources. By not using fire on the 3 Bars Project area, there would be no visual effects associated with fire on several thousand acres annually within the 3 Bars Project area. These include the effects of smoke, dead and dying vegetation, and a charred landscape. However, the use of fire and could occur on a few hundred acres annually outside the 3 Bars Project treatment areas.

The BLM would be limited to hand pulling, discing, plowing, seeding, and using livestock to control noxious weeds and other invasive non-native vegetation on several hundred acres annually on the 3 Bars Project area. These methods could result in more soil disturbance and erosion than would occur from the use of fire, but would also give the BLM greater control on the types and amount of vegetation that is removed and types of visual impacts from treatments. The West Simpson Park Unit is on rugged terrain, and use of mechanical equipment to control cheatgrass on this unit would be difficult. This area is predominantly Scenic Quality Class A, and visible to the public.

Hazardous fuels reduction and habitat improvement projects could occur on about 63,000 acres within the 3 Bars Project area, and on an additional 15,000 acres within the CESA, or about 3 percent of the acreage within the CESA. BLM treatments would help to offset some of the adverse effects to visual resources from other reasonably foreseeable future actions, but not to the extent as would occur under Alternative A.

3.19.3.4.3 Cumulative Effects under Alternative C (Minimal Land Disturbance Alternative)

Under Alternative C, effects from non-3 Bars Project reasonably foreseeable future actions on visual resources would be similar to those described under Alternative A. Adverse, short-term effects to scenic resources, primarily vegetation, associated with the use of fire and mechanized equipment would not occur under Alternative C; fire and mechanized equipment could be used in other portions of the CESA to improve habitat, remove hazardous fuels, and reduce the risk of wildfire under current and reasonably foreseeable future authorizations.

By not being able to use mechanical methods, less pinyon-juniper removal, discing, plowing, shredding, and mulching that would cause a visual contrast with untreated areas would occur under this alternative compared to Alternatives A and B. The BLM, however, would be less able to create fire and fuel breaks, remove diseased and dying pinyon-juniper, thin decadent sagebrush, restore areas dominated by cheatgrass and other noxious weeds and other invasive non-native vegetation, or restore degraded stream channels and riparian zones under this alternative than under Alternative A and B, to the detriment of the scenery on the 3 Bars Project area. The BLM would also be less able to reduce hazardous fuels and construct fire and fuel breaks, and reduce the risk of catastrophic wildfire and its effects on the scenery under Alternative C than under Alternatives A and B.

Hazardous fuels reduction and habitat improvement projects could occur on about 32,000 acres within the 3 Bars Project area, and on an additional 15,000 acres within the CESA, or only about 2 percent of the acreage within the CESA. There would be a long-term net benefit from BLM treatments that would help to offset some of the adverse effects to visual resources from other reasonably foreseeable future actions, but not to the extent as would occur under Alternatives A and B.

3.19.3.4.4 Cumulative Effects under Alternative D (No Action Alternative)

Under Alternative D, effects from non-3 Bars Project reasonably foreseeable future actions on visual resources would be similar to those described under Alternative A. There would be no cumulative effects on visual resources from 3 Bars Project treatments as no treatments would be authorized under this alternative. The BLM could create fire and fuel breaks; thin and remove pinyon-juniper to promote healthy, diverse stands; slow the spread of noxious weeds and other invasive non-native vegetation using ground-based and aerial application methods of herbicides, especially cheatgrass; restore fire as an integral part of the ecosystem; and reduce the risk of a large-scale wildfire under current and reasonably foreseeable future authorized actions, but on a very limited acreage.

Based on historic treatments in the 3 Bars Project area, only about 1,500 acres would be treated annually in the CESA to reduce hazardous fuel levels and improve ecosystem health. Hazardous fuel levels would likely increase, and only a limited number of miles of fuel and fire breaks would be constructed under this alternative compared to the action alternatives. The BLM would conduct stream bioengineering and riparian habitat enhancements on only a few miles of streams. Thus, the BLM would do little to move rangelands toward their Potential Natural Community or restore Proper Functioning Condition in wetlands and riparian zones. The trend toward large-sized fires of moderate to high severity in sagebrush and large stand-replacing fires in pinyon-juniper would likely increase. As a result, visual resource conditions would likely continue to deteriorate within the CESA.

3.19.3.5 Unavoidable Adverse Effects

Over the short-term, vegetation treatments would kill or harm vegetation in the treated area, resulting in a more open, browned or blackened landscape until new plants grow. While these effects are unavoidable, they are considered short-term impacts, as the vegetation would recover and lead to improved natural conditions. Treatment areas would vary in terms of their visual appeal prior to treatment and their distance from human activity, as well as in terms of the resulting public sensitivity to the pre- and post-treatment visual character of the area. The effects of vegetation treatments on the visual quality of the landscape would be most noticeable to travelers, sightseers, and residents for the first one to several years following treatment, particularly near major roads or residential areas (USDOI BLM 2007c:4-245). The proposed vegetation treatments would not cause unavoidable adverse effects to visual resources over the long-term.

3.19.3.6 Relationship between the Local Short-term Uses and Maintenance and Enhancement of Long-term Productivity

The proposed vegetation treatments would affect visual resources by changing the scenic quality of the landscape. Over the short-term, impacts to visual resources from all treatment methods would begin to disappear within 1 to 2 growing seasons. The regrowth of vegetation on the site would eliminate much of the stark appearance of cleared areas, and the site would develop a more natural appearance. Impacts would last for the longest amount of time in woodlands and other areas where large trees and shrubs were removed.

Over the long-term, vegetation treatments would likely improve visual resources on public lands. Treatments that aim to rehabilitate degraded ecosystems, if successful, would result in plant communities dominated by native species. Native-dominated communities tend to be more visually appealing and productive than areas that have been overtaken by noxious weeds and other invasive non-native vegetation (e.g., areas supporting a cheatgrass monoculture), or that have been invaded by woody species (e.g., sagebrush experiencing encroachment by pinyon-juniper; USDOI BLM 2007c:4-250).

3.19.3.7 Irreversible and Irretrievable Commitment of Resources

There would be no irreversible or irretrievable commitment of visual resources. Although there would be short-term impacts to visual resources from vegetation treatments, loss of visual resources would not be irretrievable and could be reversed if restoration treatments were successful.

3.19.3.8 Significance of the Effects under the Alternatives

3 Bars Project treatments could contribute to scenic degradation in the short-term, but this would be negligible in the context of other adverse impacts to visual resources in the CESA and would be in conformance with VRM objectives. By themselves, none of the 3 Bars Project treatments under all alternatives should result in a significant change in Class A scenery from Class A to Class B or to Class C in the long-term (greater than 10 years), strong visual contrast in the immediate foreground view from a designated recreation site, historic trail, or residence in the long-term (greater than 10 years), or non-compliance with VRM objectives in the long-term (greater than 10 years) within the 3 Bars Project area and CESA.

3.19.4 Mitigation

No mitigation measures are proposed for visual resources.

3.20 Land Use and Access

3.20.1 Regulatory Framework

Federal and local planning documents were reviewed to gain an understanding of the regulatory guidelines in effect within the 3 Bars Project area. The Shoshone-Eureka RMP provides a regulatory framework that applies to land use and authorizations on the 3 Bars Project area. The Eureka County Master Plan, although not a regulatory document, also provides policy recommendations for land use within the 3 Bars Project area.

The Federal Land Policy and Management Act of 1976 was implemented to establish public land policy and guidelines for its administration; to provide for the management, protection, development, and enhancement of public lands; and for other purposes (USDOI BLM 1976). Several sections within the Act deal with land use actions, including sections devoted to land use planning, land acquisition, and land disposition; authorizations to grant rights-of-ways; and other administrative actions.

The BLM *Land Use Planning Handbook* (H-1601-1) provides guidance to employees for implementing the BLM land use planning requirements established by Sections 201 and 202 of the Federal Land Policy and Management Act of 1976 (USDOI BLM 2005c). Land use plans and planning decisions are the basis for every on-the-ground action the BLM undertakes. Land use plans include both RMPs and management framework plans.

Land use plans ensure that the public lands are managed in accordance with the intent of Congress as stated in the Federal Land Policy and Management Act, under the principles of multiple use and sustained yield. As required by the Federal Land Policy and Management Act and BLM policy, the public lands must be managed in a manner that protects the quality of scientific, scenic, historical, ecological, environmental, air and atmospheric, water resource, and archaeological values; that, where appropriate, will preserve and protect certain public lands in their natural condition; that will provide food and habitat for fish and wildlife and domestic animals; that will provide for outdoor recreation and human occupancy and use; and that recognizes the Nation's need for domestic sources of minerals, food, timber, and fiber from the public lands by encouraging collaboration and public participation throughout the planning process.

The *Land Use Planning Handbook* provides guidance for preparing, revising, amending, and maintaining land use plans. This handbook also provides guidance for developing subsequent implementation (activity-level and project-specific) plans and decisions. The BLM 2800 Manual/Handbook/Instructional Memorandum Series provides policy and program direction for issuing, administering, assigning, amending, renewing, and terminating rights-of-way grants under the Federal Land Policy and Management Act and other related authorities in an environmentally, socially, and economically sound manner. The Manual/Handbook/Instructional Memorandum series also provides instructions to the program managers for right-of-way policy and program management (USDOI BLM 2008m).

The Natural Resources and Federal or State Land Use Element of the Eureka County Master Plan (Natural Resource and Land Use Plan) provides policy for natural resource management and land use on federal and state administered lands in Eureka County (Eureka County 2010). The Natural Resource and Land Use Plan was expanded in response

to the passing of Senate Bill 40. Senate Bill 40 is intended to give Nevada localities an opportunity to address federal land use management issues directly.

The Natural Resource and Land Use Plan provides land management objectives and describes how the County and the BLM and other land managers can work cooperatively to manage natural resources of interest. Topics covered in the Natural Resource and Land Use Plan include soil, vegetation, and watersheds; forage and livestock grazing; water quality, riparian areas, and aquatic habitats; wildlife and wildlife habitat; land tenure; minerals; cultural, historical, and paleontological resources; hunting, fishing, and outdoor recreation; WSAs; air quality; and law enforcement.

3.20.2 Affected Environment

3.20.2.1 Study Methods and Study Area

Existing land use plans, such as the Shoshone-Eureka RMP and Eureka County Master Plan, as well BLM Mount Lewis Field Office data, were reviewed to determine land ownership and land uses. Land authorizations and rights-of-way from BLM field office data were also reviewed and summarized. Lastly, the Mount Lewis Field Office provided tables that showed land ownership and land use authorizations.

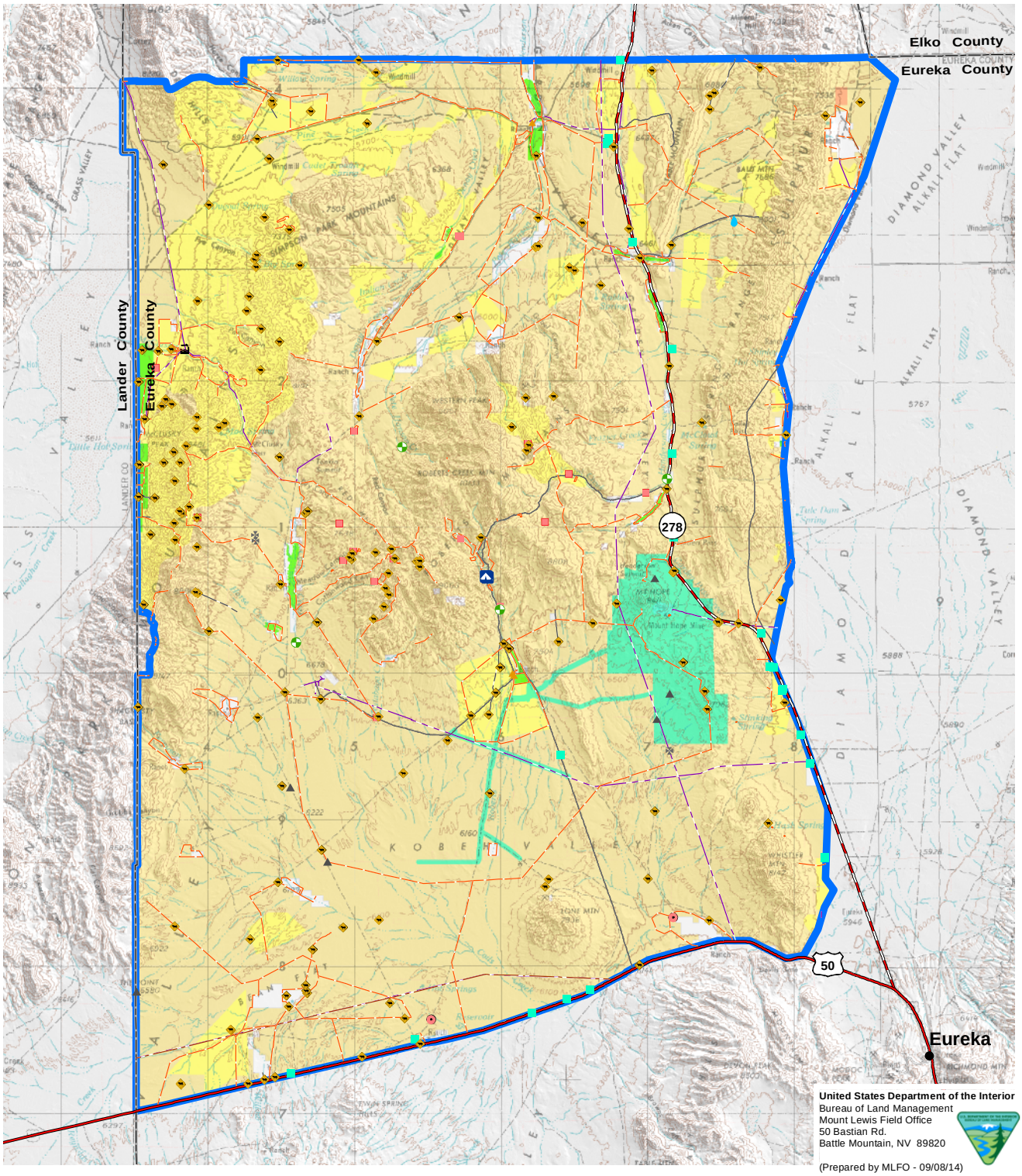
The study area for the assessment of direct, indirect, and cumulative effects for land use is the 3 Bars Project area (**Figure 3-1**).

3.20.2.2 Land Ownership and Use

The federal government is the dominant landowner within Eureka County and the project area, followed by private landowners. Federal lands within the project area are administered by the BLM. There are no U.S. Forest Service, state, or county-owned lands within the project area. **Figure 3-50** and **Tables 3-58** and **3-59** detail land ownership as well as land use authorizations within the project area.

Mining and livestock grazing are the two primary land uses within the project area. As described in the Eureka Natural Resources and Land Use Plan, open space agricultural consisting of designated grazing allotments is the single greatest land use within Eureka County (2010). Open space agricultural often consists of ranching with dispersed livestock grazing on non-irrigated rangelands. Section 3.18 contains more information about livestock grazing within the project area. There are no active mines within the project area, but there are six active mines within 30-miles. In addition, the 8,300-acre Mount Hope Project is under construction and is in the southwestern portion of the project area. The Ruby Hill Mine, operated by Homestake Mining Company of California, a subsidiary of Barrick Gold Corporation, is the closest active mine to the project area, and is 4 miles southeast of the project boundary, near the town of Eureka. In addition, there are approximately 1,227 abandoned mine sites within the project area. These abandoned sites include mine shafts and quarries. Eureka County has not adopted a zoning ordinance.

There are two WSAs within the project area, Roberts Mountains WSA and Simpson Park WSA (**Figure 3-7**). Information on WSAs is included in Section 3.22. The nearest town is Eureka, located just southeast of the junction of U.S. 50 and State Route 278 and approximately 7 miles from the southeast corner of the project area.



Legend

- Communication Site
- Dump
- Monitoring Site
- Monument
- Power Facilities
- Range Improvement
- Recreation Site
- Stream Gaging Station
- Study Plot
- Water Pumping Plant
- Road
- Fence
- Pipeline
- Telephone Line
- Transmission Line
- Irrigated Crop
- Land Exchange
- Land Treatment Area
- Material Site

Land Owner

- Bureau of Land Management
- Private

Source: BLM 2013l.

3 Bars Ecosystem and Landscape Restoration Project

Figure 3-50

Land Ownership and Land-use Authorizations

0 1 2 3 4 5 10 Miles

0 1 2 3 4 5 10 Kilometers

N

TABLE 3-58

Land Ownership within the 3 Bars Project Area and Eureka County

Land Ownership Within the Project Area	Acreage	Percent
Bureau of Land Management	729,246	97
Private	20,564	3
Total	**749,810**	**100**
Land Ownership Within Eureka County	**Acreage**	**Percent**
Bureau of Land Management	1,969,762	74
U.S. Forest Service	142,923	5
Private Ownership	554,506	21
Eureka County	1041	<0.1
State of Nevada	19	<0.1
Total	**2,668,251**	**100**

TABLE 3-59

Land Use Authorizations in the Project Area

Authorization Type	Serial Number	Total Width (feet)
Cattle Guard	NVN-000053	NA
Cattle Guard	NVN-000101	NA
Cattle Guard	NVN-000160	NA
Cattle Guard	NVN-003514	NA
Cattle Guard	NVN-003515	NA
Cattle Guard	NVN-003539	NA
Cattle Guard	NVN-004057	NA
Cattle Guard	NVN-004060	NA
Cattle Guard	NVN-004153	NA
Cattle Guard	NVN-004155	NA
Cattle Guard	NVN-004275	NA
Cattle Guard	NVN-004307	NA
Cattle Guard	NVN-004340	NA
Cattle Guard	NVN-004694	NA
Cattle Guard	NVN-004695	NA
Cattle Guard	NVN-004737	NA
Cattle Guard	NVN-004741	NA
Cattle Guard	NVN-004743	NA
Cattle Guard	NVN-004768	NA
Cattle Guard	NVN-004775	NA
Cattle Guard	NVN-004891	NA
Cattle Guard	NVN-005005	NA
Cattle Guard	NVN-005258	NA
Cattle Guard	NVN-062509	NA

TABLE 3-59 (Cont.)

Land Use Authorizations in the Project Area

Authorization Type	Serial Number	Total Width (feet)
Cattle Guard	NVN-064776	NA
Cattle Guard	NA	NA
Cattle Guard	NA	NA
Cattle Guard	NA	NA
Cattle Guard	NA	NA
Cattle Guard	NA	NA
Cattle Guard	NA	NA
Communication Site	NVN-004049	NA
Communication Site	NVN-051602	NA
Corral	NVN-000671	NA
Corral	NVN-000760	NA
Corral	NVN-000772	NA
Corral	NVN-004223	NA
Corral	NVN-040415	NA
Dump	NVN-048468	NA
Dump	NVN-048603	NA
Emergency Stabilization and Rehabilitation	NVN-004842	NA
Emergency Stabilization and Rehabilitation	NVN-059210	NA
Emergency Stabilization and Rehabilitation	NVN-595086	NA
Emergency Stabilization and Rehabilitation	NVN-595089	NA
Emergency Stabilization and Rehabilitation	NVN-595090	NA
Emergency Stabilization and Rehabilitation	NVN-595091	NA
Emergency Stabilization and Rehabilitation	NVN-595096	NA
Emergency Stabilization and Rehabilitation	NVN-595106	NA
Emergency Stabilization and Rehabilitation	NVN-595139	NA
Emergency Stabilization and Rehabilitation	NVN-595210	NA
Emergency Stabilization and Rehabilitation	NVN-595211	NA
Emergency Stabilization and Rehabilitation	NVN-595212	NA
Emergency Stabilization and Rehabilitation	NVN-595215	NA
Emergency Stabilization and Rehabilitation	NVR-004841	NA
Fence	NVN-000016	NA
Fence	NVN-000166	NA
Fence	NVN-000485	NA
Fence	NVN-004410	NA
Fence	NVR-590004	NA
Fence	NVR-590015	NA
Fence	NVR-590016	NA
Fence	NVR-590021	NA
Fence	NVR-590025	NA
Fence	NVR-590039	NA

TABLE 3-59 (Cont.)

Land Use Authorizations in the Project Area

Authorization Type	Serial Number	Total Width (feet)
Fence	NVR-590050	NA
Fence	NVR-590053	NA
Fence	NVR-590059	NA
Fence	NVR-590064	NA
Fence	NVR-590065	NA
Fence	NVR-590072	NA
Fence	NVR-590082	NA
Fence	NVR-590083	NA
Fence	NVR-590085	NA
Fence	NVR-590092	NA
Fence	NVR-590101	NA
Fence	NVR-590123	NA
Fence	NVR-590160	NA
Fence	NVR-590166	NA
Fence	NVR-590167	NA
Fence	NVR-590180	NA
Fence	NVR-590187	NA
Fence	NVR-590195	NA
Fence	NVR-590203	NA
Fence	NVR-590243	NA
Fence	NVR-590310	NA
Fence	NVR-590362	NA
Fence	NVR-590364	NA
Fence	NVR-590366	NA
Fence	NVR-590384	NA
Fence	NVR-590443	NA
Fence	NVR-590444	NA
Fence	NVR-590471	NA
Fence	NVR-590482	NA
Fence	NVR-590487	NA
Fence	NVR-590501	NA
Fence	NVR-590521	NA
Fence	NVR-590533	NA
Fence	NVR-590556	NA
Fence	NVR-590628	NA
Fence	NVR-590629	NA
Fence	NVR-590736	NA
Fence	NVR-590739	NA
Fence	NVR-590741	NA
Fence	NVR-590749	NA
Fence	NVR-590753	NA

TABLE 3-59 (Cont.)

Land Use Authorizations in the Project Area

Authorization Type	Serial Number	Total Width (feet)
Fence	NVR-590754	NA
Fence	NVR-590756	NA
Fence	NVR-590757	NA
Fence	NVR-590758	NA
Fence	NVR-590759	NA
Fence	NVR-590761	NA
Fence	NVR-590764	NA
Fence	NVR-590771	NA
Fence	NVR-590772	NA
Fence	NVR-590779	NA
Fence	NVR-591510	NA
Fence	NVR-593514	NA
Fence	NVR-593516	NA
Fence	NVR-593539	NA
Fence	NVR-593794	NA
Fence	NVR-594057	NA
Fence	NVR-594060	NA
Fence	NVR-594126	NA
Fence	NVR-594136	NA
Fence	NVR-594150	NA
Fence	NVR-594153	NA
Fence	NVR-594155	NA
Fence	NVR-594197	NA
Fence	NVR-594220	NA
Fence	NVR-594224	NA
Fence	NVR-594225	NA
Fence	NVR-594266	NA
Fence	NVR-594267	NA
Fence	NVR-594275	NA
Fence	NVR-594443	NA
Fence	NVR-594561	NA
Fence	NVR-594693	NA
Fence	NVR-594714	NA
Fence	NVR-594715	NA
Fence	NVR-594730	NA
Fence	NVR-594740	NA
Fence	NVR-594742	NA
Fence	NVR-594759	NA
Fence	NVR-594760	NA
Fence	NVR-593794	NA
Fence	NVR-594762	NA

TABLE 3-59 (Cont.)

Land Use Authorizations in the Project Area

Authorization Type	Serial Number	Total Width (feet)
Fence	NVR-594763	NA
Fence	NVR-594767	NA
Fence	NVR-594769	NA
Fence	NVR-594777	NA
Fence	NVR-594779	NA
Fence	NVR-594838	NA
Fence	NVR-594839	NA
Fence	NVR-594840	NA
Fence	NVR-594849	NA
Fence	NVR-594853	NA
Fence	NVR-594855	NA
Fence	NVR-594881	NA
Fence	NVR-594883	NA
Fence	NVR-594885	NA
Fence	NVR-594890	NA
Fence	NVR-594917	NA
Fence	NVR-594987	NA
Fence	NVR-594994	NA
Fence	NVR-595078	NA
Fence	NVR-595105	NA
Fence	NVR-595120	NA
Fence	NVR-595121	NA
Fence	NVR-595123	NA
Fence	NVR-595127	NA
Fence	NVR-595129	NA
Fence	NVR-595205	NA
Fence	NVR-595234	NA
Fence	NVR-595258	NA
Fence	NVR-595277	NA
Fence	NA	NA
Fence	NA	NA
Fence	NA	NA
Fence	NA	NA
Fence	NA	NA
Fence	NA	NA
Fence	NA	NA
Fence	NA	NA
Fence	NA	NA
Fence	NA	NA

TABLE 3-59 (Cont.)

Land Use Authorizations in the Project Area

Authorization Type	Serial Number	Total Width (feet)
Fence	NA	NA
Fence	NA	NA
Fence	NA	NA
Fence	NA	NA
Fence	NA	NA
Fence	NA	NA
Fence	NA	NA
Fence	NA	NA
Fence	NA	NA
Fence	NA	NA
Fence	NA	NA
Fence	NA	NA
Fence	NA	NA
Fence	NA	NA
Fence	NA	NA
Fence	NA	NA
Fence	NA	NA
Fence	NA	NA
Fence	NA	NA
Fence	NA	NA
Fence	NA	NA
Fence	NA	NA
Fence	NA	NA
Fence	NA	NA
Fence	NA	NA
Fence	NA	NA
Fence	NA	NA
Fence	NA	NA
Fence	NA	NA
Fence	NA	NA
Fence	NA	NA
Fence	NA	NA
Fence	NA	NA
Fence	NA	NA
Fence	NA	NA
Fence	NA	NA
Fence	NA	NA
Fence	NA	NA
Fence	NA	NA
Fence	NA	NA
Fence	NA	NA

TABLE 3-59 (Cont.)

Land Use Authorizations in the Project Area

Authorization Type	Serial Number	Total Width (feet)
Fence	NA	NA
Fence	NA	NA
Fence	NA	NA
Fence	NA	NA
Fence	NA	NA
Fence	NA	NA
Fence	NA	NA
Fence	NA	NA
Fence	NA	NA
Fence	NA	NA
Fence	NA	NA
Fence	NA	NA
Fence	NA	NA
Fence	NA	NA
Fence	NA	NA
Fence	NA	NA
Fence	NA	NA
Fence	NA	NA
Irrigated Crop	NVN-020395	NA
Irrigated Crop	NVN-048415	NA
Irrigated Crop	NVN-048443	NA
Land Treatment Area	NVN-000175	NA
Land Treatment Area	NVN-000281	NA
Land Treatment Area	NVN-000322	NA
Land Treatment Area	NVN-590002	NA
Land Treatment Area	NVN-590008	NA
Land Treatment Area	NVN-590019	NA
Land Treatment Area	NVN-590023	NA
Land Treatment Area	NVN-590044	NA
Land Treatment Area	NVN-590060	NA
Land Treatment Area	NVN-590114	NA
Land Treatment Area	NVN-590158	NA
Land Treatment Area	NVN-590190	NA
Land Treatment Area	NVN-590346	NA
Land Treatment Area	NVN-590368	NA
Land Treatment Area	NVN-590455	NA
Land Treatment Area	NVN-590456	NA
Land Treatment Area	NVN-590457	NA
Land Treatment Area	NVN-590491	NA
Land Treatment Area	NVN-590534	NA
Land Treatment Area	NVN-594729	NA

TABLE 3-59 (Cont.)

Land Use Authorizations in the Project Area

Authorization Type	Serial Number	Total Width (feet)
Land Treatment Area	NVN-594856	NA
Land Treatment Area	NVN-595188	NA
Land Treatment Area	NVR-000182	NA
Land Treatment Area	NVR-590357	NA
Land Treatment Area	NVR-590359	NA
Land Treatment Area	NVR-590360	NA
Land Treatment Area	NA	NA
Land Treatment Area	NA	NA
Land Treatment Area	NA	NA
Land Treatment Area	NA	NA
Land Treatment Area	NA	NA
Local Neighborhood Road, Rural Road, City Street	NVN-052399	NA
Local Neighborhood Road, Rural Road, City Street	NVN-052540	NA
Local Neighborhood Road, Rural Road, City Street	NVN-060918	NA
Material Site	NVN-001472	NA
Material Site	NVN-001473	NA
Material Site	NVN-001962	NA
Material Site	NVN-002186	NA
Material Site	NVN-002187	NA
Material Site	NVN-003420	NA
Material Site	NVN-022487	NA
Material Site	NVN-022489	NA
Material Site	NVN-022492	NA
Material Site	NVN-022499	NA
Material Site	NVN-023080	NA
Material Site	NVN-023082	NA
Material Site	NVN-030013	NA
Material Site	NVN-035593	NA
Material Site	NVN-035595	NA
Material Site	NVN-042799	NA
Material Site	NVN-051858	NA
Material Site	NVN-059954	NA
Material Site	NVN-292803	NA
Monitoring Site	NVN-089351	NA
Other Road	NVN-000005	NA
Other Road	NVN-000006	NA
Other Road	NVN-000009	NA
Other Road	NVN-036707	60

TABLE 3-59 (Cont.)

Land Use Authorizations in the Project Area

Authorization Type	Serial Number	Total Width (feet)
Other Road	NVN-042812	400
Other Road	NVN-048798	NA
Other Road	NVN-052540	NA
Other Road	NVN-053379	NA
Other Road	NVN-053976	40
Other Road	NVN-078526	NA
Other Road	NA	NA
Pipeline	NVN-000087	NA
Pipeline	NVN-000176	NA
Pipeline	NVN-000239	NA
Pipeline	NVN-000245	NA
Pipeline	NVN-000326	NA
Pipeline	NVN-003545	NA
Pipeline	NVN-004046	NA
Pipeline	NVN-004093	NA
Pipeline	NVN-035075	NA
Pipeline	NVN-036566	NA
Pipeline	NVN-064738	NA
Pipeline	NVN-064805	NA
Pipeline	NVN-064806	NA
Pipeline	NVR-000107	NA
Pipeline	NVR-000741	NA
Plate Tectonic Study	NA	NA
Private Road for Service Vehicles (logging, oil fields, ranches, etc.)	NVN-052540	NA
Recreation Site	NVN-002474	NA
Reservoir	NVN-000067	NA
Reservoir	NVN-000086	NA
Reservoir	NVN-000145	NA
Reservoir	NVN-000184	NA
Reservoir	NVN-004059	NA
Reservoir	NVN-005264	NA
Reservoir	NVN-048417	NA
Reservoir	NVN-053667	660
Reservoir	NA	NA
Secondary Road	NVCC-022478	NA
Secondary Road	NVN-001471	400
Secondary Road	NVN-003794	NA
Secondary Road	NVN-042812	400
Secondary Road	NVN-043007	400
Secondary Road	NVN-048798	NA

TABLE 3-59 (Cont.)

Land Use Authorizations in the Project Area

Authorization Type	Serial Number	Total Width (feet)
Secondary Road	NVN-060918	NA
Spring	NVN-000081	NA
Spring	NVN-000083	NA
Spring	NVN-000110	NA
Spring	NVN-000143	NA
Spring	NVN-000235	NA
Spring	NVN-000350	NA
Spring	NVN-000402	NA
Spring	NVN-000403	NA
Spring	NVN-000423	NA
Spring	NVN-000425	NA
Spring	NVN-000432	NA
Spring	NVN-000451	NA
Spring	NVN-000474	NA
Spring	NVN-000492	NA
Spring	NVN-000511	NA
Spring	NVN-000532	NA
Spring	NVN-000548	NA
Spring	NVN-000584	NA
Spring	NVN-000585	NA
Spring	NVN-000586	NA
Spring	NVN-000611	NA
Spring	NVN-000612	NA
Spring	NVN-000613	NA
Spring	NVN-000614	NA
Spring	NVN-000615	NA
Spring	NVN-000616	NA
Spring	NVN-000618	NA
Spring	NVN-000619	NA
Spring	NVN-000620	NA
Spring	NVN-000621	NA
Spring	NVN-000622	NA
Spring	NVN-000737	NA
Spring	NVN-000738	NA
Spring	NVN-000740	NA
Spring	NVN-000755	NA
Spring	NVN-003505	NA
Spring	NVN-003506	NA
Spring	NVN-003507	NA
Spring	NVN-003509	NA
Spring	NVN-003510	NA

TABLE 3-59 (Cont.)

Land Use Authorizations in the Project Area

Authorization Type	Serial Number	Total Width (feet)
Spring	NVN-003513	NA
Spring	NVN-003542	NA
Spring	NVN-003543	NA
Spring	NVN-003544	NA
Spring	NVN-004094	NA
Spring	NVN-004181	NA
Spring	NVN-004248	NA
Spring	NVN-040748	NA
Spring	NA	NA
Spring	NA	NA
Spring	NA	NA
Stock Tank	NVN-048472	NA
Stream Gaging Station	NVN-088802	NA
Study Plot	NVN-004436	NA
Study Plot	NVN-004443	NA
Study Plot	NVN-004561	NA
Study Plot	NVN-004730	NA
Study Plot	NVN-004760	NA
Study Plot	NVN-004777	NA
Study Plot	NVN-004779	NA
Study Plot	NVN-004849	NA
Study Plot	NVN-004881	NA
Study Plot	NVN-004883	NA
Study Plot	NVN-004885	NA
Study Plot	NVN-004917	NA
Study Plot	NVR-004136	NA
Study Plot	NVR-064714	NA
Study Plot	NVR-064715	NA
Substation	NVN-060092	NA
Telephone Line	NVN-005253	NA
Telephone Line	NVN-007318	20
Telephone Line	NVN-051022	15
Telephone Line	NVN-056120	10
Telephone Line	NVN-058497	NA
Transmission Line	NVN-005638	NA
Transmission Line	NVN-012655	25
Transmission Line	NVN-042324	NA
Transmission Line	NVN-047781	NA
Transmission Line	NVN-048321	30
Transmission Line	NVN-060092	NA
Transmission Line	NVN-063162	NA

TABLE 3-59 (Cont.)

Land Use Authorizations in the Project Area

Authorization Type	Serial Number	Total Width (feet)
Transmission Line	NVN-088978	45
Trough	NVN-000176	NA
Trough	NVN-000212	NA
Trough	NA	NA
Trough	NA	NA
Trough	NA	NA
Trough	NA	NA
Trough	NA	NA
Trough	NA	NA
Trough	NA	NA
Trough	NA	NA
Trough	NA	NA
Trough	NA	NA
US Mineral Monument	NVN-001758	NA
US Mineral Monument	NVN-001762	NA
US Mineral Monument	NVN-001763	NA
US Mineral Monument	NA	NA
US Mineral Monument	NA	NA
US Mineral Monument	NA	NA
Water Pumping Plant	NVN-000490	NA
Well - Other	NVN-000069	NA
Well - Other	NVN-000307	NA
Well - Other	NVN-000479	NA
Well - Other	NVN-000480	NA
Well - Other	NVN-000543	NA
Well - Other	NVN-000598	NA
Well - Other	NVN-004050	NA
Well - Other	NVN-004120	NA
Well - Other	NVN-004156	NA
Well - Other	NVN-004339	NA
Well - Other	NVN-040116	NA
Well - Other	NVN-040117	NA
Well - Other	NVN-040118	NA
Well - Other	NVN-040119	NA
Well - Other	NVN-040120	NA
Well - Other	NVN-040121	NA
Well - Other	NVN-040122	NA
Well - Other	NA	NA
Well - Other	NA	NA
Windmill	NVN-000040	NA
Windmill	NVN-000617	NA

TABLE 3-59 (Cont.)

Land Use Authorizations in the Project Area

Authorization Type	Serial Number	Total Width (feet)
Windmill	NVN-000653	NA
Windmill	NVN-000765	NA
Windmill	NVN-004745	NA
Windmill	NA	NA
Windmill	NA	NA
Withdrawal Class Reserves	NA	NA
Withdrawal Class Reserves	NA	NA

[1] Source: USDOI BLM (2012a, 2013k).
NA = Not applicable.

3.20.3 Environmental Consequences

3.20.3.1 Key Issues of Concern Considered during Evaluation of the Environmental Consequences

Based on the AECC and public scoping comments, two concerns specific to land use and 3 Bars ecosystem restoration were identified and are discussed in this section. These are:

- Encourage the BLM to work to balance the requirements and demands of multiple users of the land, consistent with federal multiple-use policies.
- Ensure the EIS considers the objectives of Eureka County's plans and policies.

3.20.3.2 Significance Criteria

Impacts to land use would be considered significant if BLM actions resulted in:

- Substantial conflict with existing land uses, including current land use authorizations.
- Substantial change in land use designations.
- Substantial reduction in opportunity for right-of-way authorizations and development activities.
- Substantial reduction in the opportunity for land tenure adjustments.

3.20.3.3 Direct and Indirect Effects

3.20.3.3.1 Direct and Indirect Effects Common to All Action Alternatives

Adverse effects to land use common to all alternatives include the use of treatments that may result in short-term access limitations to land uses and current land use authorizations within the analysis area.

Treatments that reduce the risk of future catastrophic wildfire through fuels reduction would reduce the risk of loss of life, property, constructed facilities on public land, and resources on the 3 Bars Project area. Collaboration with the

affected holders of a right-of-way or other authorizations and any landowners within the vicinity of the project area would be of utmost importance when implementing fire treatments. Open communication between the affected parties would limit possible negative impacts to right-of-way, other authorized development on public land, livestock, and ranch, farm, or other private properties and values (USDOI BLM 2009a).

Treatments would not result in long-term, substantial conflicts with existing land uses, changes in land use designations, or reductions in opportunity for right-of-way authorizations and development activities. Additionally, there would not be a substantial reduction in the opportunity for land tenure adjustments.

3.20.3.3.2 Direct and Indirect Effects under Alternative A (Preferred Alternative)

Riparian Treatments

There are 45 land use authorizations within the riparian treatment areas, including a corral, Emergency Stabilization and Rehabilitation areas, fences, irrigated crops, land treatment areas, roads, a pipeline, a recreation site, a reservoir, spring improvements, a stream gauging station, study plots, a telephone line, and a transmission line.

Treatments could temporarily limit access to land use authorizations in localized areas. Due to the lack of permanent features, exclusion areas, or designations, riparian treatments should not preclude future rights-of-way authorizations, development activities, or land tenure adjustments.

Aspen Treatments

There are 26 land use authorizations within the aspen treatment areas, including Emergency Stabilization and Rehabilitation areas, fences, a land treatment area, roads, a pipeline, and spring improvements. Should a land use authorization occur within a treatment area, there could be short-term exclusion from use during treatment and post-treatment restoration.

Due to the lack of permanent features, exclusion areas, or designations, aspen treatments should not preclude future right-of-way authorizations, development activities, or land tenure adjustments.

Pinyon-juniper Treatments

There are 134 land use authorizations that are within pinyon-juniper treatment units, including study plots and roads, material sites, cattle guards, pipelines, corrals, Emergency Stabilization and Rehabilitation areas, fences, land treatment areas, reservoirs, spring improvements, a recreation site, a withdrawal area, a stream gauging station, powerlines, a trough, a water pumping plant, a well, and a windmill. Access restrictions may preclude access to mineral, rights-of-way, and land use authorizations during treatment and post-treatment restoration, but this preclusion would be temporary and would constitute a negligible impact.

Sagebrush Treatments

There are 83 land use authorizations within the sagebrush treatment areas, including a study plot and roads, material sites, cattle guards, pipelines, a withdrawal area, a stream gauging station, powerlines, Emergency Stabilization and Rehabilitation areas, fences, cropland, land treatment areas, a reservoir, spring improvements, a telephone line, a waterhaul, wells, and windmills. Fencing and other exclusion methods associated with this treatment area may preclude access to mineral resources, rights-of-way, and land use authorizations during treatment and post-treatment restoration, but this restriction would be temporary and would constitute a negligible impact.

Due to the lack of permanent features, exclusion areas, or designations, sagebrush treatments should not preclude future right-of-way authorizations, development activities, or land tenure adjustments.

3.20.3.3.3 Direct and Indirect Effects under Alternative B (No Fire Use Alternative)

Because fire would not be available to reduce hazardous fuel loads and improve habitat, Alternative B may pose a greater long-term risk for wildfire than Alternative A due to the accumulation of fuels that could lead to loss of life and property. Without the use of prescribed fire, treatments could take longer, especially those needed to thin and remove Phase II and III pinyon-juniper stands, and the public may be restricted from accessing treatment sites for longer periods than if fire could be used.

There could be temporary access restrictions from treatments, but treatments would not preclude future land use authorizations within the project area, and would not conflict with county and BLM land use objectives. Because up to 6,350 acres could be treated annually, the BLM would have to closely coordinate activities with landowners within the project area and the public to ensure that landowner property and the public are not harmed by treatments.

3.20.3.3.4 Direct and Indirect Effects under Alternative C (Minimal Land Disturbance Alternative)

Because fire and mechanical methods would not be available to reduce hazardous fuel loads and improve habitat, Alternative C would pose a greater long-term risk for wildfire than Alternatives A and B due to the accumulation of fuels that could lead to loss of life and property. Without the use of fire and mechanical methods, treatments would take longer, especially those needed to thin and remove Phase II and III pinyon-juniper stands, restore lands dominated by cheatgrass and other noxious weeds and other invasive non-native vegetation, or to restore stream channels. Thus, the public may be restricted from accessing treatment sites for longer periods than if fire and mechanical methods were used.

There could be temporary access restrictions from treatments. Treatments would not preclude future land use authorizations within the project area, and would not conflict with county and BLM land use objectives. Because about 3,250 acres could be treated annually, the BLM would have to closely coordinate activities with landowners within the project area and the public to ensure that landowner property and the public are not harmed by treatments.

3.20.3.3.5 Direct and Indirect Effects under Alternative D (No Action Alternative)

There would be no direct effects to land use and access from 3 Bars Project treatments as no treatments would be authorized under this alternative. The BLM would not take actions to reduce wildfire risk, so there would be no short-term access restrictions.

3.20.3.4 Cumulative Effects

The CESA for land uses is the 3 Bars Project area (**Figure 3-1**). Past and present actions that have influenced land use and access in the 3 Bars ecosystem are discussed in Section 3.3.2.3.3.

3.20.3.4.1 Cumulative Effects under Alternative A (Preferred Alternative)

Permanent features or exclusion areas associated with the Mount Hope Project and future land development actions, in combination with 3 Bars Project activities, could impact future right-of-way authorizations, development activities, and land tenure adjustments, and conflict with Eureka County and BLM land use objectives. These effects would be greatest under Alternative A.

Catastrophic wildfire can cause extensive burns in vegetation, particularly during drought conditions when soils and vegetation are dry. Treatments should reduce the incidence and severity of wildfires. Based on past acreage burned by wildfire, an estimated 84,000 acres would burn in the CESA during the next 20 years. Wildfires could adversely affect life and property, access, and resource use, on or near the 3 Bars Project area.

The BLM is proposing to treat about 127,000 acres on the 3 Bars Project area, and about 15,000 acres under current and future authorizations, to restore ecosystem health. 3 Bars Project treatments, and potential short-term access restrictions, could occur on about 17 percent of the CESA under Alternative A. There would be no permanent features or exclusion areas associated with 3 Bars Project actions.

3.20.3.4.2 Cumulative Effects under Alternative B (No Fire Use Alternative)

Under Alternative B, effects from non-3 Bars Project reasonably foreseeable future actions on land use and access would be similar to those described under Alternative A. By not using fire on the 3 Bars Project area, there would be no land access restrictions associated with use of prescribed fire and wildland fire for resource benefit on several thousand acres annually within the 3 Bars Project area. However, by not conducting fire treatments to reduce the risk of wildfire, the potential for wildfire to adversely affect life and property, access, and resource use on or near the 3 Bars Project area would be greater than under Alternative A.

3 Bars Project treatments and potential short-term access restrictions would occur on about 63,000 acres, or about 8 percent of the CESA under Alternative B. There would be no permanent features or exclusion areas associated with 3 Bars Project actions.

3.20.3.4.3 Cumulative Effects under Alternative C (Minimal Land Disturbance Alternative)

Under Alternative C, effects from non-3 Bars Project reasonably foreseeable future actions on land use and access would be similar to those described under Alternative A. Under Alternative C, less effort would be spent by the BLM on treatments to conduct hazardous fuels and habitat improvement projects to reduce wildfire risk and improve the health and resiliency of the vegetation than would occur under Alternatives A and B. By not being able to use mechanical methods and fire, the BLM would treat fewer acres to reduce hazardous fuels, create fire and fuel breaks, remove downed wood and slash, control noxious weeds and other invasive non-native vegetation, and improve vegetation health and condition to make it more resilient to wildfire. Thus, the potential for wildfire to adversely affect life and property, access, and resource use on nor near the 3 Bars Project area would be greater than under Alternatives A and B.

3 Bars Project treatments, and potential short-term access restrictions, would occur on about 32,000 acres, or 4 percent of the CESA under Alternative C. There would be no permanent features or exclusion areas associated with 3 Bars Project actions.

3.20.3.4.4 Cumulative Effects under Alternative D (No Action Alternative)

Under Alternative D, effects from non-3 Bars Project reasonably foreseeable future actions on land use and access would be similar to those described under Alternative A. Under Alternative D, there would be no cumulative effects on land use and access from 3 Bars Project treatments as no treatments would be authorized under this alternative. The BLM could create fire and fuel breaks; thin and remove pinyon-juniper to promote healthy, diverse stands; slow the spread of noxious weeds and other invasive non-native vegetation using ground-based and aerial application methods of herbicides, especially cheatgrass; restore fire as an integral part of the ecosystem; and reduce the risk of a

large-scale wildfire under current and reasonably foreseeable future authorized actions, but on a very limited acreage (about 1,500 acres annually), under existing and likely future authorizations. Any future authorizations would undergo environmental review before authorization. There would be potential short-term access restrictions on about 0.2 percent of the CESA under Alternative D.

3.20.3.5 Unavoidable Adverse Effects

There could be temporary access restrictions from treatments. Treatments would not preclude future land use authorizations on the project area, and would not conflict with BLM land use objectives. The BLM would closely coordinate activities with landowners on the project area and the public to ensure that they are not harmed by treatments.

3.20.3.6 Relationship between the Local Short-term Uses and Maintenance and Enhancement of Long-term Productivity

There could be temporary access restrictions from treatments. Treatments that reduce the risk of future catastrophic wildfire through fuels reduction, however, would improve ecosystem resilience and sustainability and reduce the risk of life and property and public resources on or near the 3 Bars Project area from catastrophic wildfire.

3.20.3.7 Irreversible and Irretrievable Commitment of Resources

There would be no irreversible or irretrievable commitment of resources associated with land use and access.

3.20.3.8 Significance of the Effects under the Alternatives

Impacts to land use and access from actions under all the alternatives, including the construction and operation of the Mount Hope Project and other oil, gas, geothermal, and other potential development projects within the CESA, would not be significant. Under the Federal Land Policy and Management Act, public lands are managed for multiple resources, including livestock grazing, recreation and other public uses, and mining and other resource development. As noted in the Shoshone-Eureka RMP ROD, livestock grazing, mineral development, land disposal, and utility corridor designations are authorized on lands within the CESA. Thus, the 3 Bars Project and other reasonably foreseeable future actions within the CESA 1) would not conflict with existing land uses and current land use authorizations; 2) would not cause a substantial change in land use designations; 3) would not cause a substantial reduction in opportunity for rights-of-way authorizations and development activities; and 4) would not cause a substantial reduction in the opportunity for land tenure adjustments.

3.20.4 Mitigation

No mitigation measures are recommended for land use and access.

3.21 Recreation

3.21.1 Regulatory Framework

The BLM's Shoshone-Eureka RMP provides the primary regulatory framework for management of recreational opportunities within the project area since nearly all lands within the area are administered by the BLM (USDOI

BLM 1987a). The Battle Mountain District Office is in the process of updating its RMP, and the updated RMP will combine the Shoshone-Eureka and Tonopah planning areas. BLM lands within the project area are managed "to encourage safe, public access and recreational use of public lands while ensuring protection of important resource values."

There are two WSAs in the study area, Roberts Mountains WSA and Simpson Park WSA. These WSAs are discussed in more detail in Section 3.22, Wilderness Study Areas and other Special Management Areas. There are no Special Recreation Management Areas designated within the project area.

All BLM lands and recreational uses are managed as Extensive Recreation Management Areas. Extensive Recreation Management Areas are areas where management consists primarily of providing basic information and access. Dispersed recreation occurs in Extensive Recreation Management Areas, and visitors have the freedom of recreational choice with minimal regulatory constraints. Significant public recreational issues or management concerns are limited in these areas, and nominal management suffices (USDOI BLM 2007c:3-72). The Shoshone-Eureka RMP indicates that the BLM should "provide dispersed recreational opportunities" (with minimal facilities to support such activities and protect sensitive resources) within Extensive Recreation Management Areas.

In addition to recreational guidance provided in the BLM RMP, BLM Manual 6280, *Management of National Scenic and Historic Trails and Trails under Study or Recommended as Suitable for Congressional Designation*, provides guidance on management of the Pony Express National Historic Trail, and both Eureka County and the Nevada Statewide Comprehensive Outdoor Recreation Plan provides information, recommendations, and guidance related to the provision and management of statewide recreational opportunities (Eureka County 2010, Nevada Division of State Parks 2010, USDOI BLM 2012m).

3.21.2 Affected Environment

3.21.2.1 Study Methods and Study Area

Sources of recreational-related information used in this EIS include federal, state, and local land management plans (with recreational elements), visitor and activity-specific use estimates, published literature and studies, including the Mount Hope Project EIS (USDOI BLM 2012b), and personal communications with BLM staff. The proposed action and alternatives were then compared to these existing conditions to determine the potential for and expected severity of conflict with existing and planned recreational uses of the project area.

The study area for the assessment of direct and indirect effects for recreation is the 3 Bars Project area. The cumulative effects study area extends 15 miles from the project area boundary (**Figure 3-1**).

3.21.2.2 Recreation Activities and Use Levels

From October 2009 through September 2011, the BLM estimated that recreational use in the Mount Lewis Field Office planning area accounted for approximately 229,000 visitor days, of which dispersed use accounted for about 164,000 days (72 percent; USDOI BLM 2012m). Developed recreation generally occurs at constructed and/or specifically designated recreational sites and areas, while dispersed recreational use occurs away from these constructed/designated recreational sites and areas. It is unknown how much of this use occurred within the study area, though BLM staff describe project area use levels as low (around 100 visitors on a typical day across the study area, though the number of visitors can frequently be much lower and occasionally higher), and typical of more

remote, rural areas. While most of this use is likely from locals, a portion is also from visitors from other parts of the state, as well as from out-of-state visitors.

The most common recreational activities in the project area include hunting, fishing, wildlife viewing, off-highway vehicle use, horseback riding, sightseeing, mountain biking, hiking, and rock collecting (USDOI BLM 2012m, o). This range of recreational opportunities is possible because most BLM lands within the project area are open and accessible to public use via roads and trails. In most cases, activity-specific use estimates are not available for the study area.

There are a variety of hunting opportunities within the study area and region. Common species hunted include mule deer, pronghorn antelope, mountain lion, rabbits, Greater sage-grouse, chukar partridge, quail, mourning dove, and waterfowl. Big game hunt statistics for desert bighorn sheep, pronghorn antelope, and mule deer for the hunt units that are within or that overlap the analysis area are shown in **Table 3-60**. The hunt unit statistics reflect the average number of animals harvested in each unit. This is a result of the statistics being divided by multiple hunt unit groups provided in the NDOW harvest data. In addition, 172 elk hunting tags were issued and 72 elk were killed in 2011, for hunt units 161, 162, 164, 171, and 173 combined (NDOW 2012f).

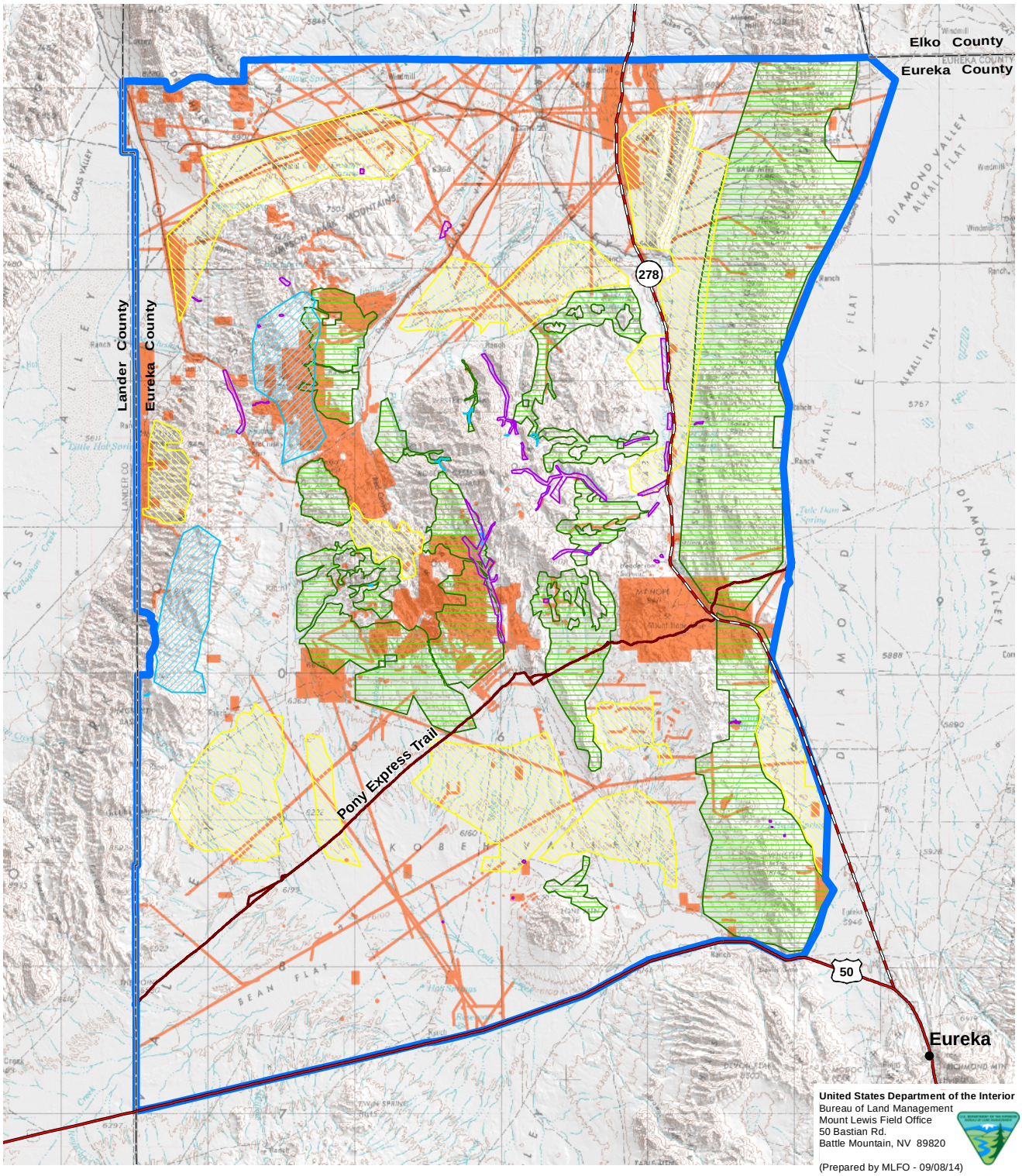
Fishing use within the 3 Bars Project area occurs primarily along Pete Hanson Creek, Birch Creek, Roberts Creek, and in the Tonkin Reservoir. The Roberts Creek Reservoir and Vinini Creek are no longer fishable and JD Ponds and Denay Creek are on private lands with restricted access. These creeks and other water bodies have trout and other sport fisheries that are popular with locals and visitors. **Table 3-61** displays annual average use estimates for creeks and water bodies in the study area (NDOW 2012f).

There are very few special recreational permits given out by the Mount Lewis Field Office for recreational activities within the project area. While the BLM permits occasional hunting related outfitting/guiding services that may occur in the project area, the primary annual permit is for XP Rides to conduct an organized ride on the Pony Express National Historic Trail (**Figure 3-51)**. This annual event, typically conducted in June, involves re-riding the entire, multi-state length of the Pony Express National Historic Trail. Additionally, there is informal recreational use of the Pony Express National Historic Trail through visits by individual users or small groups (Kreutzer 2013).

3.21.2.3 Recreation Management and Use Areas

BLM lands without special designations within the project area are currently managed as an Extensive Recreation Management Area. Dispersed types of recreation are the predominate uses within the project area, as well as the surrounding rural region. Since dispersed uses tend to require minimal constructed or developed facilities, there are few developed or designated recreational sites within the project area. There is an existing network of roads and trails that provide access to dispersed recreational opportunities throughout the study area (USDOI BLM 2012m, o).

Roberts Mountains are one of the primary recreational destinations within the project area. The Roberts Mountains have several creeks (Roberts, Pete Hanson, and Tonkin Springs) that are popular fishing spots for both locals and visitors. Other recreational opportunities in the Roberts Mountains include hiking, camping, wildlife viewing, and hunting. This area and its diverse opportunities serve as an important local recreational asset given the proximity of the Roberts Mountains to nearby towns in Eureka County and the existing network of access roads and trails throughout the study area (USDOI BLM 2012m, o).



Legend

- Pony Express Trail
- Cultural Resource Inventory
- 3 Bars Project Area
- Pinyon-juniper Treatment Area
- Sage Treatment Area
- Aspen Treatment Area
- Riparian Treatment Area

Source: BLM 2012g.

3 Bars Ecosystem and Landscape Restoration Project

Figure 3-51

Cultural Resource Inventory

0 1 2 3 4 5 10 Miles
0 1 2 3 4 5 10 Kilometers
N

TABLE 3-60

2011 Harvest by Hunt Unit and Group

Desert Bighorn Sheet				Pronghorn Antelope				Mule Deer			
Hunt Unit / Group	Tags	Number Killed	Percent Success	Hunt Unit / Group	Tags	Number Killed	Percent Success	Hunt Unit / Group	Tags	Number Killed	Percent Success
161	11	9	82	065	41	24	59	065	58	43	74
162-163	4	4	100	142				141		69	
				144				142		19	
				141	151	105	70	143		34	
				143				144		90	
				151				145		26	
				152				Management Area 14	554	238	43
				154				151		77	
				155				152		70	
				131	76	52	68	154		41	
				145				155		47	
				163				Management Area 15	548	235	43
				164				161		97	
				161	27	24	89	162		73	
				162				163		26	
								164		10	
								Management Area 16	501	206	41

Source: NDOW (2012f).

TABLE 3-61

Annual Average Fishing Use in the Study Area (1980-2010)

Creek/Water Body	Annual Average Number of Anglers (minimum/maximum)	Annual Average Angler Days (minimum/maximum)
Roberts Creek	42 (0 / 106)	126 (0 / 606)
Roberts Creek Reservoir	3 (0 / 71)	3 (0 / 71)
Pete Hanson Creek	4 (0 / 30)	7 (0 /60)
Vinini Creek	1 (0 / 20)	1 (0 / 20)
JD Ponds	10 (0 / 56)	24 (0 / 184)
Denay Creek	3 (0 / 46)	7 (0 / 184)
Tonkin Reservoir	90 (11 / 463)	220 (11 / 1,246)

Source: NDOW (2012g).

The Pony Express National Historic Trail crosses the project area (**Figure 3-51**). This national trail follows the historic route used by the Pony Express and links St. Joseph, Missouri, to Sacramento, California. While the Pony Express was only in operation for 18 months (April 1860 through October 1861), it has come to represent the Old West in each of the eight states (California, Colorado, Kansas, Missouri, Nebraska, Nevada, Utah, and Wyoming) it passes through. The section of the trail that passes through the project area is part of the Overland Canyon to Simpson Park Station High Potential Segment of the Pony Express National Historic Trail. The National Trails System Act defines a High Potential Segment as "those segments of a trail which would afford high quality recreational experience in a portion of the route having greater than average scenic values or affording an opportunity to vicariously share the experience of the original users of a historic route." The BLM has direct management

responsibility and authority for the trail within its jurisdictional boundaries, and the USDOI National Park Service is the trailwide administrator for programmatic, planning, and co-ordination purposes (USDOI National Park Service 1999, 2012, Kreutzer 2013).

3.21.3 Environmental Consequences

3.21.3.1 Key Issues of Concern Considered during Evaluation of the Environmental Consequences

Based on information in the AECC and public scoping comments the following concerns regarding recreation were identified and are discussed in this impact analysis.

- Off-highway vehicle use could damage and/or jeopardize completed restoration work.
- Treatments could promote additional off-highway vehicle use and new routes.
- If recreational opportunities are lost as a result of restoration efforts, there could be associated impacts to the local and regional economy.
- Roads and livestock facilities near roads are contributors to fire.

These and other recreational-related issues (e.g., access, visitor experiences, etc.) were considered during the evaluation of consequences that could reasonably be anticipated under the proposed restoration effort.

3.21.3.2 Significance Criteria

The proposed action and alternatives were assessed within the existing recreation management frameworks that guide recreational opportunities in the 3 Bars ecosystem and vicinity, including the Shoshone-Eureka RMP, Eureka County, Nevada Division of State Parks, and other relevant plans. For purposes of this assessment, the proposed action and alternatives are considered to have a significant effect on recreation if they meet one or more of the following significance criteria:

1. The action conflicts with formally established recreation and other appropriate public uses (i.e., would the action limit and/or restrict existing and/or future recreation and public use?).
2. The action substantially degrades or reduces the quantity or quality of the area available for existing or future recreational opportunities (i.e., would the action degrade visitor satisfaction with and/or overall quality of the recreational experience?).
3. The action results in the permanent damage or impairment of a unique, nationally significant recreational resource (i.e., would the action result in the loss of a recreational resource of regional and/or national importance?).

Impacts to historic trails would be considered significant if the proposed action or alternatives resulted in any of the following:

1. Changes to the landscape adjacent to an historic trail that cannot be mitigated to a BLM Class II VRM objective, as outline in BLM Instructional Memorandum NV-2004-004.
2. Permanent or long-term limitation of use of an identified portion of a national historic trail.

3.21.3.3 Direct and Indirect Effects

3.21.3.3.1 Direct and Indirect Effects Common to All Action Alternatives

In general, the potentially affected lands in the 3 Bars ecosystem do not offer unique recreational opportunities (WSAs are addressed separately in Section 3.22). The Pony Express National Historic Trail is the only recreational resource of national significance within the 3 Bars Project area. However, these lands do play an important role in the local provision of recreational opportunities, with a focus on dispersed uses (e.g., off-highway vehicle use, hunting, fishing, wildlife observation, etc.). As such, the restoration actions proposed under each of the alternatives would not affect developed or other areas of highly concentrated recreational use. Instead, the proposed actions would primarily influence undeveloped recreational opportunities and the users of those areas. Given the size of the 3 Bars Project area (about 750,000 acres) and relatively low levels of use (about 100 visitors on a typical day), the proposed restoration treatments would affect only a small number of visitors.

The 3 Bars ecosystem area is managed as an Extensive Recreation Management Area and open to multiple types of dispersed recreational activities. Per the proposed restoration actions, recreation and specifically off-highway vehicle use, would continue to be allowed throughout the 3 Bars Project area, although periodic closures of specific areas are anticipated to help the restoration effort and minimize human health risks. Under all treatment methods, the size of closed areas and duration of the temporary closures would be the most pronounced and potentially significant effects on recreation.

Adverse Effects

There would be some short-term scenic degradation, as well as distractions to users (e.g., noise from machinery), from treatments. Some areas would be off-limits to recreational activities as a result of treatments, for periods ranging from a few hours to days, or even 1 full growing season or longer, depending on the treatment. In most cases, recreationists would be able to find alternative sites offering the same amenities, although a lessened experience could result from more concentrated use in these alternative sites.

In the short-term (less than 3 years) general recreational impacts would be negative and include the following:

- Temporary closure and loss of recreational uses of dispersed areas during treatment implementation.
- Disturbance from workers, equipment, and/or movement of people and equipment associated with treatments.
- Temporary displacement of wildlife for both consumptive (e.g., hunting, fishing, etc.) and non-consumptive (e.g., wildlife viewing, photography, etc.) users.

The temporary closure of specific areas would be the most direct effect on recreation during the implementation of treatments proposed under each of the alternatives. Visitors would be restricted from accessing the treatment areas during implementation and possibly during post-implementation. This would generally degrade the visitor experience (in particular for those visitors who intended to visit an area closed for treatment), and displace visitors to other dispersed use areas within the 3 Bars ecosystem and/or other regional areas.

In addition to displacing visitors, the proposed treatments could also temporarily displace wildlife. However, this could increase the availability of wildlife in adjacent areas that do not have access or public use restrictions. While both visitors and wildlife could be displaced during the proposed treatments, there could also be more wildlife-related

opportunities in areas not affected by closures (e.g., a higher density of game animals in non-treatment areas). So, while temporary displacement of visitors and wildlife could be considered a negative effect, there could also be a related beneficial impact to wildlife-dependent recreational opportunities and experiences in nearby areas not affected by the treatments.

Recreational users of the Pony Express National Historic Trail could potentially be impacted by treatment activity and noise during implementation of the treatments and the visual aspects of the recreational experience of the trail may be affected in the short-term until vegetation recovers to the point where it no longer appears that it has been manipulated.

Beneficial Effects

Long-term, the effects of treatments on recreation would be positive and would include the following:

- Restoration of the historic landscape that would be beneficial to the visitor experience, including the Pony Express National Historic Trail retracement experience.
- Improved habitat and associated wildlife.
- A reduction in the presence and number of noxious weeds and other invasive non-native vegetation.
- A reduction in the risk of a large-scale, catastrophic wildfire.

Improved habitat and associated wildlife and a reduction in noxious weeds and other invasive non-native vegetation should contribute to an enhanced recreational experience in the 3 Bars ecosystem. Improved fish and game habitat and populations should provide additional and/or improved hunting and fishing opportunities. Improved habitat should enhance the overall scenic quality of the area, while removal of noxious weeds and other invasive non-native vegetation would reduce the likelihood of visitors being harmed or inconvenienced by these plants, and could influence the visitor experience. Additionally, a reduction in wildfire risk should lead to fewer temporary closures to protect human safety (i.e., fewer public access constraints from fires).

3.21.3.3.2 Direct and Indirect Effects under Alternative A (Preferred Alternative)

Riparian Treatments

Adverse Effects

Short-term effects would generally be negative, and include temporary closures or lack of access to fishing sites, visitor displacement (to other fishing sites), and potential degradation in the visitor experience, both from the temporary closures and visual disturbances associated with the various treatment methods.

While temporary closures would be likely during manual treatments, this type of treatment would result in the fewest impacts to recreation. Since manual treatments tend to be most feasible on smaller-scales, only small areas would be subject to temporary recreation and public use closures. During manual treatments, there could be some distractions from additional staff and equipment, though given the scale of these efforts, these distractions would not likely overly degrade scenic quality.

Mechanical treatments would be used to restore stream channel functionality. Activities at treatment sites could distract visitors, and large equipment used to restore stream channels could be heard for several miles. Direct habitat

alteration or loss of habitat could occur in Lahontan cutthroat trout and other game fish streams (Birch, Pete Hanson, and Willow Creeks) and cause reduced fishing opportunities for fishermen.

Small, temporary exclosure fencing could be used to exclude livestock, wild horses, and other wild ungulates from riparian zone treatment areas for a minimum of 2 growing seasons. Although visitors could likely scale fences to access treatment sites, if desired, fences could discourage recreational use of the area.

Beneficial Effects

Treatments would improve the aesthetic and visual qualities of recreational areas for hikers, birdwatchers, and other public land users; reduce the risk of recreationists coming into contact with noxious weeds and other invasive non-native vegetation; increase the abundance and quality of plants harvested from public lands; and improve habitat for fish and wildlife sought after by fishermen and hunters.

Given the location of proposed riparian treatments along stream corridors and along other waterbodies, in particular in several areas that are popular for fishing, the effects of riparian projects on recreation would likely be more pronounced for anglers compared to other visitors. The enhancements to riparian zones and game fish habitat would also improve the recreational experience (e.g., cohesive visual landscape, healthier fish populations and potential catch rates, etc.).

Removal of pinyon-juniper in the riparian zone for all treatments groups, except the Black Spring and Denay Pond groups, would enhance its capabilities to function as a fire or fuel break. These treatments would reduce the spread of future wildfires on public lands used for recreation. As a result, recreationists would be provided with safer conditions, and there would be less of a chance that a wildfire would destroy a large acreage of lands used for recreation. Severe wildfires are capable of causing damage to recreational resources over large areas that subsequently require long periods of time for recovery. In addition, treatments that reduce the risk of wildfire would reduce the likelihood of recreationists being displaced from their favorite hunting, fishing, and camping sites by wildfires.

Aspen Treatments

Aspen treatments could result in wildlife habitat enhancements that have the potential to beneficially influence the recreational experience in the long-term in these areas. Aspen stands are unique, and quite beautiful in the fall when the leaves change colors, and efforts to preserve and enhance these stands would benefit sightseers.

Most pinyon-juniper removal would occur near roads to promote development of fire breaks near aspen stands. Fire breaks would help to protect aspen stands, and other woodland and rangeland habitat from wildfire. Protection of 3 Bars Project resources would be beneficial to users of these resources, and reduce the amount of area that would be closed to recreational users due to emergency stabilization and rehabilitation of burned areas.

Pinyon-juniper Treatments

Adverse Effects

Pinyon-juniper treatment projects would affect off-highway vehicle use, hunting, and other dispersed uses that occur in the 3 Bars ecosystem. Additionally, several of the pinyon-juniper treatment projects are proposed along creeks that provide fishing opportunities. Anglers who use these creeks would be affected by the treatments. In the short-term,

temporary closures, distractions and changes in the scenic integrity of the landscape, and degradation of the experience would negatively affect recreational users.

Recreationists likely would not be excluded from Phase I areas where pinyon-juniper removal is primarily done using manual methods, especially if the treatments do not result in substantial soil disturbance and reseeding is not necessary. Low-intensity treatments such as thinning would generally be less restrictive to recreational uses than treatments such as discing. People recreating in nearby areas would be able to hear the motorized equipment and could be exposed to some exhaust smells, but these effects would last only as long as the treatment itself. After the completion of treatments, vegetation would be absent from large portions of the landscape and bare soil would be exposed, making the site less desirable for recreation. The use of heavy machinery would disrupt the treatment area, breaking limbs and disturbing soil. It is also likely that some large debris would be left behind, creating obstacles for certain types of recreational uses (USDOI BLM 2007c:4-120).

Prescribed burns would require the closure of burn areas to visitors during burn activities. People recreating in nearby areas would be able to see and perhaps smell smoke. The potential for smoke inhalation could result in some health risks to these users (see Section 3.26, Human Health and Safety), depending on their vicinity and position (i.e., upwind or downwind) in relation to the fire. Because smoke impairs visibility, views of the landscape could be blocked during burning. These effects would reduce the recreational experience, but would typically last only as long as the burn treatment itself. After a fire, the burned area would appear blackened, and some residual vegetation would be charred, making the area undesirable for most recreational uses for a period of 1 or more years. Four-wheel drive vehicles and other off-highway vehicles could be excluded from areas treated with fire to minimize damage to these sites while they revegetate. Low impact uses such as camping and hiking would generally not be restricted, but it is likely that burned areas would be avoided by users engaging in these types of activities. Visitation to a prescribed burn area would decline drastically or cease altogether in the short-term (USDOI BLM 2007c:4-120).

As a result of thinning and removal treatments, the number of pinyon pine and juniper trees within woodland products harvest areas would be reduced. Treatments would affect approximately 26 percent of the total designated woodland products harvest area, including Christmas tree, green wood, and commercial and public pine nut harvest areas. Removal of pinyon pines and juniper from these areas would eliminate or limit the ability to harvest woodland products there, although most of the project area would not be affected.

Beneficial Effects

Pinyon-juniper treatments would improve woodland health, productivity, and functionality; slow the expansion of pinyon-juniper into sagebrush and riparian plant communities; increase pine nut production; and reduce the risk of catastrophic wildfire, to the benefit of recreational users. Treatments could also lead to increased forage for wildlife, and water for fish, and increase the capacity of the land to support game fish and wildlife and increased hunting and fishing opportunities. However, these gains may not be realized for a decade or more, or until treated areas have fully recovered.

The BLM allows firewood and Christmas tree harvesting, greenwood cutting, and pine nut gathering on the 3 Bars Project area, and would continue to do so in the future in treatment and non-treatment areas. The BLM would also allow the public to cut live pinyon-juniper trees in areas where pinyon-juniper trees are tightly spaced and harming the growth of herbaceous vegetation and sagebrush, in order to help slow pinyon-juniper encroachment into riparian, aspen, and sagebrush habitats. These actions would promote recreation, by promoting a healthier woodland and rangeland that in turn would promote woodland recreational activities, healthy populations of fish and game, and an

enhanced scenic quality. By thinning and removing pinyon-juniper, competition among remaining trees for water and other resources would decline, and the remaining pinyon pines should be able to produce more nuts for use by the public. Downed logs would also be placed in streams to benefit game fish habitat.

Fuels reduction treatments would reduce the severity of future wildfires on public lands used for recreation. As a result, recreationists would be provided with safer conditions, and there would be less of a chance that a wildfire would destroy a large acreage of lands used for recreation. Wildfires are capable of causing damage to recreational resources over large areas that subsequently require long periods of time for recovery. In addition, treatments that reduce the risk of wildfire would reduce the likelihood of recreationists being displaced from their favorite hunting, fishing, and camping sites by wildfires (USDOI BLM 2007c:4-122).

Sagebrush Treatments

Adverse Effects

Recreationists likely would not be excluded from areas such as those in the Alpha Unit group and Table Mountain 1 and Three Corners units, where Phase I and Phase II pinyon-juniper would be thinned to promote forb, grass, and sagebrush development using manual and mechanical equipment.

Prescribed fire, along with other treatment methods, could be used to manage noxious weeds and other invasive non-native vegetation on the West Simpson Park Unit. Recreationists would be excluded from prescribed fire areas during the burn, but would be allowed into the burn area when the BLM deems it is safe for re-entry. Treatment sites would be posted to inform the public of any access restrictions. During treatments, there would be some scenic degradation and distractions to users (noise from machinery and crews), but given the small amount of area treated annually, these effects should be minor.

Biological control has been identified for use on the 3 Bars Project area. Grazing may be used to maintain firebreaks and to help reduce wildfire risk in this area. Grazing can contribute to the spread of noxious weeds and other invasive non-native vegetation through preferential grazing of native vegetation over weeds, and by movement of noxious weeds and other invasive non-native vegetation into uninfested areas in livestock feces (USDOI BLM 2009b). The spread of noxious weeds and other invasive non-native vegetation could degrade recreational resources on the 3 Bars Project area.

Much of the focus of treatments on sagebrush treatment units to improve habitat for fish and game species of importance to sportsmen. Manual and mechanical treatments could result in increased water runoff and erosion, and spills of fuels and lubricants, to the possible detriment of game fish populations in these creeks.

Beneficial Effects

Treatments that restore native vegetation and natural fire regimes and ecosystem processes would be beneficial to recreationists. Treatments would reduce the risk of recreationists coming into contact with noxious weeds and other invasive non-native vegetation; increase the abundance and quality of plants harvested from public lands; and improve habitat for fish and wildlife sought after by fishermen and hunters and the recreational experience through improved scenery and increased populations of fish and game species.

Over 85 percent of the acres treated would occur where the BLM has determined that pronghorn antelope habitat is declining, nearly 65 percent of acres treated would occur where Greater sage-grouse habitat is declining, and 45

percent of the acres treated would occur where mule deer habitat is declining. Manual and mechanical treatments would create a grass-shrub mosaic favored by Greater sage-grouse, pronghorn antelope, mule deer, and other wildlife that could be harvested by hunters.

Removal of pinyon-juniper through thinning, and seeding and planting, should enhance the visitor experience. By removing pinyon-juniper to promote the reestablishment of grasses, forbs, and sagebrush, habitat for wildlife and game species would improve (Lauer and Peek 1976, Willms et al. 1981, Payne and Bryant 1998).

Efforts to restore areas dominated by non-native vegetation would make these areas more visually appealing and better suited for fish and wildlife, and would reduce the risk of future wildfires, all of which benefit the recreationist.

3.21.3.3.3 Direct and Indirect Effects under Alternative B (No Fire Use Alternative)

The types and magnitude of effects for manual, mechanical, and biological control treatments would be similar between Alternatives A and B. Because the BLM would not be able to use fire, however, there would be none of the adverse effects associated with this treatment type. In particular, there would be no harm to recreationists from prescribed fire and wildland fire for resource benefit. However, with greater reliance on mechanical methods, there may be greater disturbance to the public from the use of mechanical equipment than would occur under Alternative A.

Acres and types of wetland and riparian habitat treated would be similar to Alternative A, and the BLM would use small, temporary exclosure fencing to protect treatment areas. However, the BLM would not use fire to slow pinyon-juniper encroachment into sagebrush and riparian communities, or treat Phase II and III pinyon-juniper to improve woodland health and reduce hazardous fuels. Thus, there would be fewer gains in wildlife forage production outside of riparian zones, and greater risk of habitat loss from catastrophic wildfire, under this alternative than under Alternative A, to the detriment of recreational resources and the public.

Some treatments to improve historic pinyon-juniper communities would occur, which could benefit future pine nut harvest in these areas long-term, but the acreage benefiting from these treatments would be substantially less than under Alternative A.

3.21.3.3.4 Direct and Indirect Effects under Alternative C (Minimal Land Disturbance Alternative)

Under Alternative C, the BLM would only be able to use manual and classical biological control methods to treat vegetation. The consequences of not using fire under Alternative C would be the same as those discussed under Alternative B.

Effects to visitors from noise and disturbance associated with mechanical treatment equipment would not occur under this alternative. By not being able to use mechanical equipment, however, the BLM would also not be able to conduct stream engineering and restoration, except on a limited basis on only a few stream miles; control noxious weeds and other invasive non-native vegetation, except on very small areas where this vegetation can be hand pulled or controlled using hand tools; reseed and replant restoration sites, except for small areas where shrubs and other vegetation would be planted by hand; or create fire and fuel breaks to reduce the risk of fire spread, except near existing roads or aspen stands, or along a few miles of stream. As a result, there would be less improvement in vegetation and water quantity and quality, and more risk of catastrophic wildfire, than under Alternatives A and B, to the detriment of the recreational user.

The BLM has not identified areas where it would use classical biological control on the 3 Bars Project area. The use of biological control agents would have few effects on recreational areas and visitors to public lands since they would be used on a limited number of acres and to specifically control undesirable species without disturbing desirable vegetation or the land. During the release of biological control agents, there would be some workers present that could cause a minor distraction to visitors in the area.

Under Alternative C, the BLM would not substantially improve the native vegetation community nor stop the loss of important ecosystem components. As a result, the visitor use experience could decline long-term.

3.21.3.3.5 Direct and Indirect Effects under Alternative D (No Action Alternative)

There would be no direct or indirect effects on recreation from 3 Bars Project treatments as no treatments would be authorized under this alternative. Thus, long-term loss of recreational opportunities and deterioration in the visitor experience would be greatest under Alternative D.

3.21.3.4 Cumulative Effects

The CESA for recreation is approximately 2,599,851 acres and includes the 3 Bars Project area and the BLM visual resource management background distance zone (15 miles; **Figure 3-1**). This area was selected based on the anticipated increase in population and corresponding demand for recreational opportunities by residents in the project vicinity (e.g., Eureka, Battle Mountain, etc.), as well as the location of other nearby recreational resources (e.g., Hickison Petroglyph Recreation Site). Approximately 94 percent of the area is administered by the BLM and 6 percent is privately owned. Past and present actions that have influenced land use and access in the 3 Bars ecosystem are discussed in Section 3.3.2.3.3.

3.21.3.4.1 Cumulative Effects under Alternative A (Preferred Alternative)

In general, while there are locally important recreational resources in the CESA, the types of dispersed recreational resources available in the area are not of regional or national significance except the Pony Express National Historic Trail, which has been Congressionally designated as a recreational resource. Recreational use within the CESA is thus likely to increase proportionally to changes in the regional population. As recreational use increases over time, there tends to be an inevitable increase in public demand for recreational opportunities and a corresponding increase in expectations about the quality of the recreational experience. The cumulative effects from the proposed 3 Bars Project, as well as past, present, and reasonably foreseeable future actions are considered within this context of increasing population and recreational demand, including potential changes in recreational resources and experiences.

The BLM would continue ongoing management reviews to ensure proper livestock management and long-term success of treatments. The BLM would also continue to conduct wild horse gathers, AML reviews and adjustments, remove excess animals and use fertility control, improve water developments, and implement habitat projects. Efforts to better distribute livestock and wild horses across the rangeland should provide for a more natural visitor experience and reduce the potential for livestock/wild horse/visitor conflicts.

The BLM could apply herbicides using ground-based methods under existing authorizations. These treatments would be small and have few visitor impacts. The BLM could also use aerial herbicide applications to control cheatgrass on several hundred or more acres annually on the West Simpson Park Unit. There could be short-term visitor access restrictions in treatment areas. However, the units consist of degraded lands of low recreational value.

The population within southern Eureka County is projected to increase by 50 percent during construction and operation of the Mount Hope Project. With an increase in population in the CESA due to population growth, and employment opportunities such as the Mount Hope Project, the number of recreational users in the CESA should increase. Recreational users in the 3 Bars analysis area can spread noxious weeds and other invasive non-native vegetation that attaches itself to vehicles or to clothing or shoes, and can later cause new noxious weeds and other invasive non-native vegetation infestations, possibly impacting other land uses within the CESA.

Land, mineral, oil, gas, geothermal, and other development would increase levels of land disturbance and spread of noxious weeds and other invasive non-native vegetation within the 3 Bars Project and nearby areas. Development would lead to additional human activity in the area, and possible degradation of other land uses within the analysis area. Past mining activities associated with the Atlas Gold Bar Mine degraded rangeland resources on about 1,300 acres within the CESA. The proposed Mount Hope Project would disturb about 8,300 acres, and fencing would be used to restrict public access on an additional 6,000 acres. As noted in the Mount Hope Project EIS, mining could substantially alter the groundwater level near the mine pit, causing a drawdown in water that could affect surface water flows, groundwater levels, and vegetation on Roberts Mountains and in Kobeh Valley and Diamond Valley, to the detriment of native vegetation and fish and wildlife habitat (USDOI BLM 2012b:3-74 to 3-90). In addition, removal of Mount Hope would have an impact on the historic setting of the Pony Express National Historic Trail. The mountain is visible for miles and its removal will alter the character of the trail and the ability of recreationists to experience the trail as it existed in 1860-61. In addition, access would be virtually eliminated for a segment of the trail that passes within the mine boundary. The 3 Bars Project would not significantly add to this impact since none of the proposed treatments would further limit access to any portion of the trail within the 3 Bars Project Area. These effects could degrade the recreational experience within the CESA.

Catastrophic wildfire can burn extensive areas of vegetation. Based on acreage burned by wildfires since 1985, an estimated 140,000 acres would be burned by wildfires in the CESA during the next 20 years. To reduce the risk of catastrophic wildfire and to restore the health and resiliency of native vegetation, the BLM would treat up to 127,000 acres to reduce hazardous fuels. The BLM also proposes to treat hazardous fuels on an additional 15,000 acres under current authorizations in high to very high fire risk areas within the CESA. Recreational access to treatment areas could be restricted during the treatment period, and it is likely that the treated area would have few recreational values, for several years after treatments. Over time, this reduction in fuels, however, would allow for more natural forage within the project area, benefiting game populations and hunting opportunities, and improve the health of pinyon-juniper stands, which could benefit nut production. In addition, treatments would reduce the risk of catastrophic wildfire, which would benefit native plant communities and fish and game.

3 Bars Project treatments would occur on only about 5 percent of the CESA. Treatments would result in localized effects and would not substantially alter the availability of dispersed recreational opportunities in the CESA or larger region. However, by nature, many types of dispersed uses (e.g., off-highway vehicle use, hunting, wildlife viewing, etc.) require large tracts of undeveloped or little used natural areas. Actions that permanently alter and fragment the landscape (e.g., energy development, mining, land development, etc.), as well as similar unforeseen future actions, could eventually affect both the availability of dispersed use opportunities and experiences.

3.21.3.4.2 Cumulative Effects under Alternative B (No Fire Use Alternative)

Under Alternative B, effects from non-3 Bars Project reasonably foreseeable future actions on recreation would be similar to those described under Alternative A. By not using fire, the amount of area disturbed by treatments would generally be smaller, and have less impact on fish and wildlife resources, and scenery, than other treatment methods.

However, fewer acres would also be treated to restore landscape health and habitat for fish and game, and reduce the risk of catastrophic wildfire, and would not likely offset the increased potential for more extensive and intense wildfires to occur in place of controlled burns on the 3 Bars Project area.

About 63,000 acres of vegetation and 31 miles of stream would be disturbed from the 3 Bars Project, or only about 2 percent of the CESA. Treatments would result in localized effects and would not substantially alter the availability of dispersed recreational opportunities in the CESA or larger region. Still, there would be a long-term net benefit from BLM treatments that would help to offset some of the adverse effects to recreational resources from other reasonably foreseeable future actions. Actions would provide more recreational opportunities for a growing population, but not to the extent as would occur under Alternative A.

3.21.3.4.3 Cumulative Effects under Alternative C (Minimal Land Disturbance Alternative)

Under Alternative C, effects from non-3 Bars Project reasonably foreseeable future actions on recreation would be similar to those described under Alternative A. By not being able to use mechanical methods there would be less disturbance to public from treatments compared to Alternatives A and B. Without mechanical methods, however, the BLM would be less able to reduce hazardous fuels, remove noxious weeds and other invasive non-native vegetation, thin and remove vegetation to encourage understory development, create fire and fuel breaks, and remove downed wood and slash. The risk of wildfire and its effects on recreation would likely increase, while there would be few benefits to fish and game, under this alternative compared to Alternatives A and B.

About 32,000 acres of vegetation and 8 miles of stream would be disturbed from the 3 Bars Project, or only about 1 percent of the CESA. Treatments would result in localized effects and would not substantially alter the availability of dispersed recreational opportunities in the CESA or larger region. Still, there would be a minor long-term net benefit from BLM treatments that would help to offset some of the adverse effects to recreational resources from other reasonably foreseeable future actions. Actions would provide more recreational opportunities for a growing population, but not to the extent as would occur under Alternatives A and B.

3.21.3.4.4 Cumulative Effects under Alternative D (No Action Alternative)

Under Alternative D, effects from non-3 Bars Project reasonably foreseeable future actions on recreation would be similar to those described under Alternative A. There would be no cumulative effects on recreation from 3 Bars Project treatments as no treatments would be authorized under this alternative. The BLM could create fire and fuel breaks; thin and remove pinyon-juniper to promote healthy, diverse stands; slow the spread of noxious weeds and other invasive non-native vegetation using ground-based and aerial application methods of herbicides, especially cheatgrass; restore fire as an integral part of the ecosystem; and reduce the risk of a large-scale wildfire under current and reasonably foreseeable future authorized actions, but on a very limited acreage (about 1,500 acres annually; less than 0.1 percent of the CESA). Thus, benefits to the recreating public would be substantially less under this alternative than under the action alternatives.

3.21.3.5 Unavoidable Adverse Effects

There would be some scenic degradation, as well as distractions to users (e.g., noise from machinery), from treatments. In addition, there would be some human health risks to recreationists associated with exposure to smoke from fire. Finally, some areas would be off-limits to recreational activities as a result of treatments. These effects would be localized and short-term.

3.21.3.6 Relationship between the Local Short-term Uses and Maintenance and Enhancement of Long-term Productivity

There would be some scenic degradation, as well as distractions to users (e.g., noise from machinery), from treatments. These effects would be localized and short-term. Treatments that restore native vegetation and natural fire regimes and other ecosystem processes would be beneficial to recreationists. Treatments would improve the aesthetic and visual qualities of recreational areas for hikers, bikers, horseback riders, and other public land users; reduce the risk of recreationists coming into contact with noxious weeds and other invasive non-native vegetation; increase the abundance and quality of plants harvested from public lands; and improve habitat for fish and wildlife sought by fishermen and hunters. These benefits would be long-term and improve the productivity of land resources and their ability to provide recreational values (USDOI BLM 2007c:4-250).

3.21.3.7 Irreversible and Irretrievable Commitment of Resources

There would be no irreversible or irretrievable commitment of recreational resources. Although there would be short-term impacts to recreational resources from vegetation treatments, these impacts would not be irretrievable and could be reversed if restoration treatments were successful.

3.21.3.8 Significance of the Effects under the Alternatives

Under all the alternatives, direct and indirect effects of 3 Bars Project treatments, along with effects from other actions within the CESA, would not have a significant permanent conflict with formally established recreation and other appropriate public uses over the long-term. Public access to the Mount Hope Project would be limited until the mine was reclaimed, and there may be access restrictions in other areas with resource development. As discussed in the Mount Hope Project EIS and ROD, few permanent restrictions are anticipated from the mine project (USDOI BLM 2012b:4-81) and there would be no permanent access restrictions associated with the 3 Bars Project.

Under all the alternatives, direct and indirect effects of 3 Bars Project treatments would not result in long-term changes to the landscape adjacent to the Pony Express National Historic Trail that cannot be mitigated to a BLM Class II Visual Resource Management objective, as outline in BLM Instructional Memorandum NV-2004-004, or in permanent or long-term limitation of use of an identified portion of the trail. The BLM would follow guidance in BLM Manual 6280, *Management of National Scenic and Historic Trails and Trails under Study or Recommended as Suitable for Congressional Designation*, to ensure proper management of the Pony Express National Historic Trail (USDOI BLM 2012n).

In the long-term, actions that would occur within the CESA would not significantly degrade or reduce the quantity or quality of the area that is available for existing or future recreational opportunities. 3 Bars Project restoration treatments could degrade or reduce recreational opportunities in the short-term (< 5 years), but treatments should result in a healthy and functional landscape that provides additional recreational opportunities. Up to 15,000 acres could be off-limits to the public due to mining and other land uses for up to 70 years, but these areas are subject to reclamation requirements and would have minimal long-term effects on recreational opportunities in the CESA (USDOI BLM 2012b:4-81).

3.21.4 Mitigation

No mitigation measures are recommended for recreation.

3.22 Wilderness Study Areas, Special Management Areas, and Lands with Wilderness Character

3.22.1 Regulatory Framework

The BLM manages certain lands under its jurisdiction that possess unique and important historical, anthropological, ecological, biological, geological, and paleontological features. These features include undisturbed wilderness tracts, critical habitat, natural environments, open spaces, scenic landscapes, historic locations, cultural landmarks, and paleontological-rich regions. Special management is administered with the intent to preserve, protect, and evaluate these significant components of our national heritage. Most special areas are either designated by an Act of Congress or by Presidential Proclamation, or are created under BLM administrative procedures.

The National Landscape Conservation System is the primary management framework for these specially designated lands. The National Landscape Conservation System was created in June 2000 by the BLM to bring into a single system some of the agency's premier areas. National Landscape Conservation System designations include National Monuments, National Conservation Areas, Designated Wilderness and WSAs, National Scenic and Historic Trails, and Wild, Scenic, and Recreational Rivers (USDOI BLM 2007c:3-70).

The only lands within the National Landscape Conservation System that are on the 3 Bars Project area are the Roberts Mountains WSA and a portion of the Simpson Park WSA, and the Pony Express National Historical Trail.

Wilderness Study Areas have been designated by the BLM as having wilderness characteristics, thus making them worthy of consideration by Congress for wilderness designation. While Congress considers whether to designate a WSA as permanent wilderness, the BLM manages the area to prevent impairment of its suitability for wilderness designation. BLM Manual 6330, *Management of BLM Wilderness Study Areas,* guides management decisions made for specific areas of public lands under wilderness review by Congress (USDOI BLM 2012p). The policy applies to the following: 1) WSAs identified by the wilderness review required by Section 603 of the Federal Land Policy and Management Act; 2) WSAs established by Congress; and 3) WSAs identified through the land use planning process in Section 202 of Federal Land Policy and Management Act. The purpose of the manual is to prevent impairment of the wilderness values, described in Section 2(c) of the Wilderness Act of 1964 (Public Law 88/577). The manual allows for actions that clearly benefit a WSA by protecting or enhancing these characteristics even if they are impairing, though they must still be carried out in the manner that is least disturbing to the site. Wilderness Study Areas are managed under the manual until such time as Congress makes a determination regarding wilderness designation; the manual would apply to the WSAs in the project area.

The Eureka County Natural Resource and Land Use Plan is an executable policy for natural resource management and land use on federal- and state-administered lands in Eureka County (Eureka County 2010). The Natural Resource and Land Use Plan was expanded in response to the passing of Nevada Senate Bill 40. Senate Bill 40 is intended to give Nevada localities an opportunity to address federal land use management issues directly. This bill requires that "A Plan or statement of policy must be approved by the governing bodies of the county and cities affected by it, and by the governor before it is put into effect."

As stated in the Natural Resources and Land Use Plan, a goal pertaining to Wilderness Areas, WSAs, and other special management areas is to "Seek immediate Congressional designation action on all WSAs and other restrictive land classifications based on Eureka County policy to release these areas for multiple use management and in the

interim prevent, minimize or mitigate impairment or degradation of such areas to the extent that Congressional actions are not pre-empted." Similarly, an objective is to "Develop comprehensive guidance to Congress seeking release of all WSAs deemed by the Department of Interior to be unsuitable for wilderness designation to multiple use management."

Approximately 41 miles of the Pony Express National Historical Trail are within the 3 Bars Project area. This national trail follows the historic route used by the Pony Express and links St. Joseph, Missouri, to Sacramento, California. While the Pony Express was only in operation for 18 months (April 1860 through October 1861), it has come to represent the Old West in each of the eight states (California, Colorado, Kansas, Missouri, Nebraska, Nevada, Utah, and Wyoming) it passes through. The section of the trail that passes through the project area is part of the Overland Canyon to Simpson Park Station High Potential Segment of the Pony Express National Historic Trail. The National Trails System Act defines a High Potential Segment as "those segments of a trail which would afford high quality recreation experience in a portion of the route having greater than average scenic values or affording an opportunity to vicariously share the experience of the original users of a historic route." The BLM has direct management responsibility and authority for the trail within its jurisdictional boundaries, and the USDOI National Park Service is the trailwide administrator for programmatic, planning, and co-ordination purposes (USDOI National Park Service 1999, 2012, Kreutzer 2013).

In 2009 as part of a National Historic Trail feasibility study under Omnibus Public Land Management Act, Congress identified the Central Overland Trail as a potential National Historic Trail. This trail would occur within the 3 Bars Project area. The National Park Service is currently studying the feasibility, suitability, and desirability of adding this and other routes to the existing California National Historic Trail. The Central Overland Trail largely corresponds to the Pony Express National Historic Trail, but the two trails do vary in places, mostly over short distances.

3.22.2 Affected Environment

3.22.2.1 Study Methods and Study Area

Land use plans such as the Shoshone-Eureka RMP, Eureka County Natural Resources and Land Use Plan, and Mount Hope Project EIS, and online BLM sources were reviewed to determine wilderness and special management areas within the project area.

The study area for the assessment of direct and indirect effects is the 3 Bars Project area, while the cumulative effects study area is the 3 Bars Project area and that portion of the Simpson Park WSA that is outside of the project area (**Figure 3-1**).

3.22.2.2 Special Management Areas

There are no National Monuments, National Conservation Areas, Designated Wilderness Areas, or Wild, Scenic, and Recreational Rivers on the 3 Bars Project area. The Pony Express National Historic Trail is within the 3 Bars Project area. The route of the Pony Express National Historic Trail crosses the southern portion of the 3 Bars Project area, and three stations and one water source known to have been used by the Pony Express are within or immediately adjacent to the project boundary. From east to west, these are located at Sulphur Spring, Roberts Creek, Goodwin, and Grubbs Well. Additional stops in the project vicinity are Diamond Springs (Diamond City), on the east side of Diamond Valley, and Dry Creek, situated at the base of the Simpson Park Range.

In the 1999 Comprehensive Management Plan/EIS developed for the Pony Express, California, Oregon, and Mormon Pioneer national historic trails, the National Park Service identified the route from the mouth of Overland Canyon at Huntington Valley (Eureka County) to Simpson Park Station, northeast of Austin (Lander County), as a high potential segment of the National Historic Trail. This segment crosses the project area. BLM Manual 6280, *Management of National Scenic and Historic Trails and Trails under Study or Recommended as Suitable for Congressional Designation*, which guides management of national historic trails crossing BLM jurisdiction, requires NEPA analyses of "the extent to which the proposed action would affect the Federal Protection Components, including high-potential historic sites or high-potential route segments located on public land" (USDOI BLM 2012n). No high potential historic sites are identified along the Overland Canyon to Simpson Park Station High Potential Segment (Kreutzer 2013).

There are two WSAs within the project area, Roberts Mountains WSA and Simpson Park WSA (**Figure 3-7)**. Roberts Mountains WSA is wholly contained within the project area, while Simpson Park WSA is partially contained within the project area. The Roberts Mountains WSA includes 15,090 acres of public land and consists of rugged mountainous areas and contains three prominent peaks. Vegetation includes willow, cottonwood, aspen, birch, and dogwood. Mountain mahogany trees and limber pine are found in isolated stands on the barren rock ridges The Roberts Mountains WSA is generally in a natural state, provides an outstanding opportunity for solitude, and offers opportunities for primitive and unconfined recreation such as cross-country skiing, horseback riding, rock hounding, hiking, and hunting. About 487 people use the Roberts Mountains WSA annually (USDOI BLM 2012b:3-471).

Roberts Mountains are the type locality (the geologic point of first recognition) of the Roberts Mountains Thrust, which is a major geologic structure in western North America. The area has been referred to as "the Window of the World" because of the unique view it gives of the complex geologic structure of the region and has been studied by professional geologists and students from across the nation because of its rare qualities and geologic importance (USDOI BLM 2012b).

The Simpson Park WSA includes 49,119 acres of public land and 147 acres of privately owned in-holdings; 14,872 acres of public lands and 22 acres of private in-holdings are within the 3 Bars Project area. The WSA consists of mountainous country with scattered stands of aspen and mountain mahogany. The Simpson Park WSA is generally in a natural state, provides limited to good opportunities for solitude, and offers outstanding opportunities for hiking, horseback riding, and hunting. About 150 people use the Simpson Park WSA annually (USDOI BLM 2012b:3-476).

3.22.2.3 Lands with Wilderness Character

An inventory of Lands with Wilderness Characteristics was completed in 2012 for Battle Mountain District, as part of the Resource Management Plan Revision in progress for the District. That inventory did not show any areas meeting the criteria for Lands with Wilderness Character in the 3 Bars Project area, thefore Lands with Wilderness Character are "not present, not effected" and the proposed land treatments and project activities as part of the 3 Bars Project should not impact any Lands with Wilderness Character. Future project activities in upcoming years may be subject to additional and appropriate site-specific review under NEPA, and the inventory may be updated at that time as part of such site-specific review. The inventory also will be updated as the Resource Management Plan Revision further progresses for the whole Battle Mountain District.

3.22.3 Environmental Consequences

3.22.3.1 Key Issues of Concern Considered during Evaluation of the Environmental Consequences

Based on the AECC and public scoping comments, one concern specific to WSAs and other Special Management Areas and 3 Bars ecosystem restoration was identified and is discussed in this section. This concern was that the expanded ease of livestock movement in cleared country may shift and intensify livestock use on adjacent wilderness lands, which could impair their naturalness characteristics.

3.22.3.2 Significance Criteria

Impacts to WSAs would be considered significant if BLM actions resulted in nonconformance with BLM Manual 6330, *Management of BLM Wilderness Study Areas* (USDOI BLM 2012p).

Impacts to historic trails would be considered significant if the Proposed Action or alternatives result in any of the following:

- Long-term changes to the landscape adjacent to a historic trail that cannot be mitigated to a BLM Class II VRM objective, as outlined in BLM Instructional Memorandum NV-2004-004.
- Permanent or long-term limitation of use of an identified portion of a national historic trail.

3.22.3.3 Direct and Indirect Effects

3.22.3.3.1 Direct and Indirect Effects Common to All Action Alternatives

The BLM proposes to restore up to 393 acres on the Roberts Mountains WSA and 8 acres on the Simpson Park WSA, or less than 1 percent of the acreage in WSAs on the 3 Bars Project area. The BLM may also treat additional aspen habitat in the Simpson Park WSA in the future after site-specific aspen inventories are completed.

Treatments within the Roberts Mountains and Simpson Park WSAs could temporarily impair the wilderness characteristics of solitude, naturalness, and primitive and unconfined recreation within and adjacent to these areas. The overall effect of treatments on the WSAs would depend on whether the end condition of the treatment site (considering both long-term benefits and short-term effects) was an improvement in wilderness characteristics. In many cases (e.g., an eradication of a small population of an incipient pest, a prescribed fire that mimicked historical fire), communities in the treatment area would quickly recover, and the overall effect would be positive.

Manual treatments would be the least obtrusive method to use in WSAs and the most appropriate. Manual treatment methods are typically focused on small areas, which would have localized impacts on naturalness, solitude, and primitive and unconfined recreation. Manual treatment methods would also result in fewer effects on naturalness from short-term effects from mechanized equipment and intrusions, noise, and other disturbances.

It is possible that treatment activity would be visible or audible to visitors on the WSAs or Pony Express National Historic Trail during the treatment period, but such activity would not significantly adversely affect the visitor's recreational/historical experience. In addition, the treatment would not adversely affect the historical character and scenic value of the trail landscape, or any artifacts or National Register-eligible historic properties associated with the

Pony Express National Historic Trail. It is possible that treatment sites could be accessed using roads that overlie the trail, but access would not occur via the historic trail. The BLM cultural resources specialist would evaluate each proposed treatment at the time of implementation and, in coordination with the National Park Service as appropriate, would make a recommendation to the authorized officer for an appropriate buffer width around the trail based on the type of treatment to be used, the integrity of the potentially affected trail segment, and other factors as necessary.

3.22.3.3.2 Direct and Indirect Effects under Alternative A (Preferred Alternative)

Riparian Treatments

Under the proposed action, the BLM would treat up to 9 acres along Roberts Creek within the Roberts Mountains WSA. There would be no riparian treatments within the Simpson Park WSA or on or near the Pony Express National Historic Trail.

Adverse Effects

Mechanical treatments within WSAs are allowed for the enhancement of wilderness characteristics in accordance with BLM Manual 6330. Thinning and removal of vegetation are allowed in WSAs where prescribed fire in the WSA will inevitably cause unacceptable risks to life, property, or natural resources outside the WSA; or where natural successional processes have been disrupted by past human activity to the extent that intervention is necessary in order to return the ecosystem to a condition where natural processes can function; or where non-native species have altered the fire regime so that wildfires pose an undue risk to the native ecosystem.

Treatment methods would result in ground disturbance, noise, and other disturbances that may temporarily degrade the naturalness of the treatment area, and opportunities for solitude and primitive and unconfined recreation within the area. These effects would occur on a small area (up to 9 acres) over a short period of time (a few months) and would temporarily result in a negligible adverse effect.

Beneficial Effects

Beneficial effects would include enhancing the naturalness and primitive and unconfined recreation of the WSAs after restoration was completed. In WSAs, treatments would only be allowed in order to improve the natural condition of these areas. Although stream enhancement could result in substantial ground disturbance on up to 9 acres, treatments would restore native vegetation within the riparian zone and improve stream habitat for Lahontan cutthroat trout and game fish. The reduction of hazardous fuels and noxious weeds and other invasive non-native vegetation on lands adjacent to or near wilderness and special areas would provide long-term benefits by reducing the likelihood that noxious weeds and other invasive non-native vegetation would spread onto these unique areas, or that a catastrophic wildfire would burn through them and degrade their unique qualities.

Aspen Treatments

The BLM has identified approximately 62 acres within the Roberts Mountains WSA for aspen treatments. The BLM may also treat additional aspen habitat in the Simpson Park WSA in the future after site-specific aspen inventories are completed. No aspen treatments would be or near the Pony Express National Historic Trail. Aspen treatments would focus on improving the health of aspen stands by removing pinyon-juniper to reduce tree competition at JD-A4 (23 acres), RM-A2 (11 acres), and RM-A10 (28 acres) within the Roberts Mountains WSA, and constructing small,

temporary exclosure fencing to promote aspen sucker survival at SFF-A1 (8 acres) within the Simpson Park WSA; exclosure fencing could also be used to protect treatment sites within the Roberts Mountains WSA.

Adverse Effects

Treatment methods would result in short-term ground disturbance, noise, and other disturbances that may temporarily degrade the naturalness of the treatment area, and opportunities for solitude and primitive and unconfined recreation within the area. Felling of pinyon-juniper and construction of small, temporary exclosure fencing would impact the visual qualities of the treatment area. These effects would be lessened by chipping or removing downed pinyon-junipers and using downed logs to create stream habitat, and removing fencing once aspen stands are restored.

Beneficial Effects

Removal of pinyon-juniper trees in aspen stands has the potential to damage or disturb aspen. However, aspen respond well to disturbance, which stimulates suckering. Removal of conifers would allow sunlight to reach the woodland floor and warm the soil, thereby stimulating aspen sprouting, and could also create conditions that allow aspen to expand onto surrounding areas and restore the naturalness of the treatment area. Removal of encroaching pinyon-juniper near roads would enable roads near aspen stands to function as fire breaks, and would help to limit the spread of wildfire, to the benefit of the WSAs.

Small, temporary exclosure fencing and ensuring proper livestock management would benefit areas that contain aspen. Fencing should have substantial benefit for aspen, as past studies have observed that aspen stands that are protected from grazing successfully regenerate and form multi-aged stands without using fire or other disturbance (Kay 2001, 2002, 2003). Thus, these actions would benefit the natural qualities of the treatment area.

Pinyon-juniper Treatments

The BLM has identified approximately 323 acres within the Roberts Mountains WSA for pinyon-juniper treatments. Treatments would occur on the Birch Creek (175 acres), Upper Pete Hanson (126 acres), and Upper Roberts Creek (21 acres) units. The Henderson, Three Bars Ranch, and Sulphur Spring Wildfire Management units overlap the Pony Express National Historic Trail. However, the BLM cultural resources specialist would evaluate each proposed treatment at the time of implementation and, in coordination with the National Park Service as appropriate, would make a recommendation to the authorized officer for an appropriate buffer width around the trail based on the type of treatment to be used, the integrity of the potentially affected trail segment, and other factors as necessary.

Adverse Effects

Treatment methods would result in short-term ground disturbance, noise, and other disturbances that may temporarily degrade the naturalness of the treatment area and opportunities for solitude and primitive and unconfined recreation within the area. Most of the pinyon-juniper on the Upper Roberts Creek and Upper Pete Hanson units would be removed from Phase I stands using chainsaws. Because these trees have encroached into sagebrush habitat, and are widely-spaced throughout the area, removal of these trees would restore the natural characters associated with sagebrush habitat and would have a minor visual effect. Manual treatments would be the least obtrusive method for use in the Roberts Mountains WSA. Because this method of vegetation removal is very selective, damage to non-target vegetation would be minimized. Although an appropriate buffer would be applied to minimize impacts to the Pony Express National Historic Trail, users of the trail may still detect activity and noise during project

implementation and the effects of the treatments may be visible from the trail until the vegetation no longer shows signs of treatment.

Beneficial Effects

Removal of pinyon-juniper on the Birch Creek, Upper Pete Hanson, and Upper Roberts Creek units would encourage shrub and riparian vegetation growth and restore the natural condition of these units. All but 3 acres within these units are rated "High" for their scenic qualities. Treatments would maintain or improve the wilderness qualities of an area without causing effects that are incompatible with established wilderness principles.

The creation of fuel breaks on or near the Roberts Mountains WSA would provide long-term benefits by reducing the likelihood that a catastrophic wildfire would burn through the WSA and degrade its unique qualities.

Sagebrush Treatments

No sagebrush treatments are proposed for WSAs. The Roberts Mountain Pasture and Coils Creek units overlap the Pony Express National Historic Trail. The BLM cultural resources specialist would evaluate each proposed treatment at the time of implementation and, in coordination with the National Park Service as appropriate, would make a recommendation to the authorized officer for an appropriate buffer width around the trail based on the type of treatment to be used, the integrity of the potentially affected trail segment, and other factors as necessary. Although an appropriate buffer would be applied to minimize impacts to the Pony Express National Historic Trail, users of the trail may still detect activity and noise during project implementation and the effects of the treatments may be visible from the trail until the vegetation no longer shows signs of treatment.

3.22.3.3.3 Direct and Indirect Effects under Alternative B (No Fire Use Alternative)

The BLM anticipates treating about half as many acres (about 200 acres) within WSAs under Alternative B as under Alternative A. The types and magnitude of effects for manual and mechanical treatments within WSAs would be similar between Alternatives B and A. Because the BLM would not be able to use fire, there would be none of the adverse effects to the wilderness experience associated with the use of fire. Without the use of fire, there would be no localized deterioration of air quality and reduced visibility caused by smoke, no disturbance, and no blackened appearance that could affect the naturalness of treatment areas. As noted under Alternative A, no fire treatments would be conducted in WSAs for any of the alternatives.

3.22.3.3.4 Direct and Indirect Effects under Alternative C (Minimal Land Disturbance Alternative)

Under Alternative C, the BLM would only be able to use manual and classical biological control methods to treat vegetation. The types and magnitude of effects for manual treatments would be similar to those for the other alternatives, although the BLM would likely treat substantially fewer acres in WSAs under this alternative than under Alternatives A and B.

3.22.3.3.5 Direct and Indirect Effects under Alternative D (No Action Alternative)

There would be no direct or indirect effects on WSAs and the Pony Express Trail from 3 Bars Project treatments as no treatments would be authorized under this alternative. The BLM, however, would not create fire and fuel breaks; thin and remove pinyon-juniper to promote healthy, diverse stands; slow the spread of noxious weeds and other invasive non-native vegetation, especially cheatgrass; restore fire as an integral part of the ecosystem; or reduce the

risk of a large-scale wildfire, which could have adverse effects on WSAs and the Pony Express Trail. Long-term, there would be less chance of improvement of WSAs under this alternative than under the action alternatives.

3.22.3.4 Cumulative Effects

The CESA for WSAs is approximately 784,182 acres and includes the 3 Bars Project area and that portion of the Simpson Park WSA that is outside the 3 Bars Project boundary (**Figure 3-1**). Approximately 97 percent of the CESA is administered by the BLM and 3 percent is privately owned. Past and present actions that have influenced land use and access in the 3 Bars ecosystem are discussed in Section 3.3.2.3.3.

3.22.3.4.1 Cumulative Effects under Alternative A (Preferred Alternative)

Historic livestock grazing and wild horse use have led to the degradation of riparian and aspen habitat, establishment and spread of noxious weeds and other invasive non-native vegetation, and expansion of pinyon-juniper beyond its historical ranges in portions of the WSAs. To improve forage and water resources, the BLM would continue ongoing management reviews to ensure proper livestock management and long-term success of treatments.

The BLM would also continue to conduct wild horse gathers, AML reviews and adjustments, remove excess animals and use fertility control, improve water developments, and implement habitat projects. There are no HMAs that overlap with WSAs, but wild horses do move onto the Roberts Mountains during the summer and use the Roberts Mountains WSA. Efforts to distribute wild horses more evenly across the rangeland should help to reduce grazing pressure on the Roberts Mountain WSA. However, the Mount Hope Project would exclude wild horses from about 14,000 acres for up to 70 years, and as a result wild horses may spend more time in the Roberts Mountains WSA in search of food and water. The BLM would provide alternate water sources for wild horses in Kobeh Valley (USDOI BLM 2012b:3-439). By developing additional water sources, wild horses would be able to use foraging areas that are currently underutilized in Kobeh Valley.

The BLM would treat noxious weeds and other invasive non-native vegetation within WSAs under existing authorizations. New infestations would typically be found in newly burned or disturbed areas, and in areas where livestock and wild horses congregate. Treating infestations while they are small and reducing the amount of area covered by existing large infestations, would result in fewer effects on the WSAs.

The population within southern Eureka County is predicted to increase by 50 percent during construction and operation of the Mount Hope Project. With an increase in population and employment opportunities, the number of users of WSAs should increase. Users could spread noxious weeds and other invasive non-native vegetation that attaches itself to clothing or shoes.

The Mount Hope Project would disturb about 8,300 acres, but would have no direct impact on WSAs, although it will be visible from the WSAs. Potential indirect impacts to the Roberts Mountains WSA could occur if groundwater pumping activities decrease the flows in Roberts Creek or other streams associated with the Roberts Mountains WSA). Removal of Mount Hope would have an impact on the historic setting of the Pony Express National Historic Trail. The mountain is visible for miles and its removal would alter the character of the trail and the ability of recreationists to experience the trail as it existed in 1860-61. In addition, access would be virtually eliminated for a segment of the trail that passes within the mine boundary. The 3 Bars Project would not significantly add to this impact since none of the proposed treatments would further limit access to any portion of the trail within the 3 Bars Project Area. These effects could degrade the recreational experience within the CESA.

Wildfire has been relatively uncommon on the Roberts Mountains, but the 106,479-acre Trail Fire in 1999, and several other fires that have burned tens to hundreds of acres, have occurred on or near the Simpson Park WSA (see **Figure 3-33**). An estimated 84,000 acres could burn from wildfires during the next 20 years, based on wildfire occurrence since 1985.

To reduce wildfire risk and improve ecosystem health, approximately 127,000 acres would be treated on the 3 Bars Project area, and an additional 15,000 acres could be treated under current and future authorizations within the CESA, or about 16 percent of the CESA, but only on about 1 percent of WSAs. Although the acreage treated within WSAs would be minor, treatments elsewhere in the CESA would help to reduce hazardous fuels and improve ecosystem health, and reduce the potential for catastrophic wildfire that could have substantial adverse effects on WSAs and lands adjacent to the Pony Express Trail.

3.22.3.4.2 Cumulative Effects under Alternative B (No Fire Use Alternative)

Under Alternative B, effects from non-3 Bars Project reasonably foreseeable future actions on WSAs and the Pony Express Trail would be similar to those described under Alternative A. Fire would not be used on WSAs under any of the alternatives. However, fire could not be used under this alternative on about 78,000 acres elsewhere in the CESA under the 3 Bars Project and current and reasonably foreseeable future authorizations, or about 8 percent of the CESA. Without being able to use of fire on other portions of the CESA, the BLM would be less successful in reducing the risk of catastrophic wildfire within the CESA, and would not likely offset the increased potential for more extensive and intense wildfires to occur in place of controlled burns on the 3 Bars Project area compared to Alternative A. As demonstrated by wildfires in 1999, wildfires can have substantial effects on WSAs and could also affect the scenery near the Pony Express Trail.

3.22.3.4.3 Cumulative Effects under Alternative C (Minimal Land Disturbance Alternative)

Under Alternative C, effects from non-3 Bars Project reasonably foreseeable future actions on WSAs and the Pony Express Trail would be similar to those described under Alternative A. Adverse, short-term effects to wilderness characteristics, primarily solitude and visual qualities, associated with the use of fire and mechanized equipment would not occur under Alternative C. However, fire and mechanical treatments would be little used under Alternatives A and B, so the cumulative effects associated with WSA treatments among the action alternatives would show few differences.

The BLM would treat only about 10 acres annually in the WSAs, and about 33,000 acres within the remainder of the CESA, or about 4 percent of the CESA. By not being able to use mechanical methods, fire, and livestock to reduce hazardous fuels, create fire and fuel breaks, stimulate development of understory vegetation, and remove downed wood and slash, however, the risk of wildfire and its adverse impacts on WSAs and lands near the Pony Express Trail would likely be greater on the CESA under Alternative C than under Alternatives A and B.

3.22.3.4.4 Cumulative Effects under Alternative D (No Action Alternative)

Under Alternative D, effects from non-3 Bars Project reasonably foreseeable future actions on WSAs and the Pony Express Trail would be similar to those described under Alternative A. There would be no cumulative effects on WSAs or the Pony Express Trail from 3 Bars Project treatments as no treatments would be authorized under this alternative. The BLM could create fire and fuel breaks; thin and remove pinyon-juniper to promote healthy, diverse stands; slow the spread of noxious weeds and other invasive non-native vegetation using ground-based and aerial application methods of herbicides, especially cheatgrass; restore fire as an integral part of the ecosystem; and reduce

the risk of a large-scale wildfire under current and reasonably foreseeable future authorized actions, but on a very limited acreage (about 1,500 acres annually). Thus, benefits to the WSAs and the Pony Express Trail would be less under this alternative than under the action alternatives.

3.22.3.5 Unavoidable Adverse Effects

Use of manual and mechanical treatments could potentially cause the loss of non-target native vegetation.

3.22.3.6 Relationship between the Local Short-term Uses and Maintenance and Enhancement of Long-term Productivity

Impacts to resources within WSAs would begin to disappear within 1 to 2 growing seasons after treatment, regardless of the treatment method. The regrowth of vegetation on the site would eliminate much of the stark appearance of cleared areas, and the site would develop a more natural appearance. The longest lasting impacts would occur in woodlands and other areas where large trees and shrubs are removed. Benefits to plants and animals in terms of ecosystem function and improved forage and cover would occur as the treated area recovered.

Over the long-term, vegetation treatments would likely improve resources on WSAs. Treatments that aim to rehabilitate degraded ecosystems would result in plant communities that are dominated by native species (see Section 3.12, Native and Non-invasive Vegetation Resources, for more information). Native-dominated communities often provide better habitat for fish and wildlife, including species of concern, than communities dominated by noxious weeds and other invasive non-native vegetation.

3.22.3.7 Irreversible and Irretrievable Commitment of Resources

There would be no irreversible or irretrievable commitment of resources. Although there would be short-term impacts to wilderness and special area resources from vegetation treatments, impacts would not be irretrievable and could be reversed if restoration treatments are successful.

3.22.3.8 Significance of the Effects under the Alternatives

There would be negligible to minor impacts to solitude and other wilderness opportunities from 3 Bars Project treatments under all alternatives, but these actions would affect less than 0.1 percent of WSAs annually, and would last only a few years. The BLM would ensure that treatment actions conform to guidance in BLM Manual 6330, *Management of BLM Wilderness Study Areas* (USDOI BLM 2012p).

Under all the alternatives, direct and indirect effects of 3 Bars Project treatments would not result in long-term changes to the landscape adjacent to the Pony Express National Historic Trail that cannot be mitigated to a BLM Class II Visual Resource Management objective, as outlined in BLM Instructional Memorandum NV-2004-004, or in permanent or long-term limitation of use of an identified portion of the trail. Treatments would also not permanently impact the solitude and scenic value of the trail or the ability of visitors to vicariously share the 19th century Pony Express experience. The BLM would follow guidance in BLM Manual 6280, *Management of National Scenic and Historic Trails and Trails under Study or Recommended as Suitable for Congressional Designation*, to ensure proper management of the Pony Express National Historic Trail (USDOI BLM 2012n).

3.22.4 Mitigation

No mitigation measures for WSAs are recommended.

3.23 Cultural Resources

The following discussion provides an overview of the cultural resources that have been identified and can be expected to be found on the 3 Bars Project area. A cultural resource is any defined location of past human activity, occupation, or use, identifiable through field investigation, historical documentation, or oral histories. Cultural resources include prehistoric, historic, ethnohistoric, or architectural sites, structures, places, objects, and artifacts (USDOI BLM 1999b). Cultural resources in the 3 Bars Project area are divided into three groups: prehistoric archaeological resources, historic archaeological and architectural resources (discussed in this section), and Traditional Cultural Properties, which are discussed in Section 3.24, Native American Traditional/Cultural Values, Practices, and Resources. Historic properties are those historic or prehistoric cultural resources that, through consultation with the Nevada State Historic Preservation Officer and Advisory Council on Historic Preservation, have been determined to be eligible for inclusion in the National Register of Historic Places (NRHP).

3.23.1 Regulatory Framework

There are several laws and acts that pertain to the protection of historic and cultural resources and the rights of Native American tribes. The Historic Sites Act of 1935 provides for the preservation of historic American sites, buildings, objects, and antiquities of national significance. The National Historic Preservation Act of 1966 (16 USC § 470 et seq.) requires federal agencies to take into account the potential effects of their actions on properties that are listed or are eligible for listing on the NRHP, and to consult with State Historic Preservation Officers, Native American tribes, and local governments regarding the effects of federal actions on historic properties. The Archeological Resources Protection Act of 1979 prohibits the excavation, removal, damage, or other alteration or defacement of archaeological resources on federal or Native American lands without a permit. The American Indian Religious Freedom Act of 1978 (Public Law 95-341) requires federal land managers to include consultation with traditional Native American religious leaders in their management plans. The Native American Graves Protection and Repatriation Act of 1990 recognizes the property rights of Native Americans in certain cultural items, including Native American human remains and sacred objects.

Executive Order 13084, Consultation and Coordination with Indian Tribal Governments, directs federal agencies to respect tribal self-government and sovereignty, tribal rights, and tribal responsibilities whenever they formulate policies that "significantly or uniquely affect Indian tribal governments."

3.23.2 Affected Environment

3.23.2.1 Study Methods and Study Area

Mount Lewis Field Office databases consisting of Geographic Information System shapefiles and a Microsoft Access database with information about cultural resources, studies, and investigations that have been conducted within and in the vicinity of the 3 Bars Project area were reviewed. These were supplemented with information from the Nevada Cultural Resources Information System. These baseline data provided the framework for determining the types of cultural resources that are found within the project area, and an assessment of impacts that may result from implementation of the project alternatives. These data were also used to prepare a *Cultural Context 3 Bars Ecosystem*

and Landscape Restoration Project report that described the cultural resources and cultural setting of the 3 Bars project area (AECOM 2012).

The study area for the assessment of direct and indirect effects for cultural resources is the 3 Bars project area. The cumulative effects study area for cultural resources includes the project area and a 5-mile buffer around the project area (**Figure 3-1**).

3.23.2.2 Cultural Setting

The 3 Bars Project area and its vicinity are known to contain numerous traces of past human activity ranging from early Native American sites and artifacts to the remains of early trails and transportation and communication routes (including the route of the Pony Express), mining, charcoal production, and ranching and agriculture. Such materials can be found at many locations on the landscape and represent the traces of human activities that in some cases extend as far back as 10,000 to 8,000 years before the present (BP).

3.23.2.2.1 Prehistory

The project area is in central Nevada within the western area of the Great Basin, as defined by Elston (1986). The most pertinent cultural chronology of this portion of the western Great Basin can be derived from data resulting from excavations conducted at the Gatecliff Shelter (Thomas 1983a). Additional information has been provided by d'Azevedo (1986), Jennings (1986), Janetski and Madsen (1990), Grayson (1993), Madsen and Rhode (1994), Beck and Jones (1997 *cited in* Beck 1999), Kelly (1997), Madsen and Simms (1998), and Beck (1999). Additional information from surveys conducted within the Reese River and Monitor Valleys by Thomas and Bettinger (1976) and Thomas (1983b, 1988) are also relevant. Within the broader context defined by the Early, Middle, and Late Archaic Periods, five chronological phases have been defined by Thomas (1983b): Clipper Gap (5500–4500 BP), Devils Gate (4550–3550 BP), Reveille (3550 BP–1300 BP), Underdown (1300–600 BP), and Yankee Blade (600 BP–historic). Elston (1986) postulates a Grass Valley Phase (*circa* [*ca.*] 10,000–8000 BP) for the Paleoarchaic Period and a hiatus in occupation between 8000 and 5500 BP. These phases are summarized below.

Paleoarchaic Period (ca. 10,000–8000 BP)

Paleoarchaic (or "Pre-Archaic") sites dating to as early as 11,000 years BP are known from eastern Nevada such as those documented at the Ely Airport (BLM Report CRR 8111 [NV 040] 2005-1512), Sunshine Well (Jones et al. 1996), and Giroux Wash (Stoner et al. 2000). One of the main characteristics distinguishing Paleoarchaic sites from other prehistoric cultural manifestations is the presence of fluted implements such as Clovis and Folsom projectile points and distinctive nonfluted Plano projectile point forms, crescent-shaped implements, choppers, gravers, punches, and an assemblage of steep-edged scrapers, which are primarily unifacial. Paleoarchaic assemblages are most often found in surface contexts associated with late Pleistocene and early Holocene pluvial lake and lacustrine environments of the region; therefore, researchers have concluded that they are the remains of a settlement pattern geared toward the exploitation of marsh and lake-edge resources in valley floors or in riparian corridors (Elston et al. 1981, Elston 1982, Madsen 1982, Davis and Rusco 1987, Beck and Jones 1988 *cited in* Beck 1999).

Although Thomas (1982a) postulated a lack of occupation before 8000 BP in the central Great Basin, Elston (1986) indicated that the Pre-Archaic period is marked by the Grass Valley Phase between *ca.* 10,000 and 8000 BP as indicated by the presence of Western Stemmed series and fluted points. The Western Stemmed series is represented by leaf-shaped, Lake Mohave stemmed, and lanceolate projectile points, usually found in surface contexts. Associated

constituents consist of flake tools, thick triangular scrapers, bifacially flaked knife-choppers, and steep-sided hafted scrapers.

Early Archaic Period (8000–5000 BP)

At the end of the Paleoarchaic Period, shifting land-use patterns, subsistence systems, and the emergence of a wide variety of implement types marked the beginning of the Archaic Period (Bryan 1979, Elston et al. 1979, Aikens and Madsen 1986, Jennings 1986, Jones et al. 1996). Site locations from the earlier years of the Archaic Period suggest continued adaptations to lakeshore environments (Madsen 1982, Jones et al. 1996, Stoner et al. 2000), although the variety of implements and types of materials used appears to have increased. Projectile point styles consisted of Stemmed, Pinto, and Lake Mojave types. The people of the Early Archaic Period seem to have inhabited a much more diverse landscape with a more flexible subsistence system than the Paleoarchaic peoples who preceded them. They utilized not only valley floors and lake margins, but cave sites and upland areas as well.

Elston (1986) suggested a hiatus in occupation within central Nevada between 8000 and 5500 BP. Thomas (1982a) indicated that the later portion of the Early Archaic is represented by the Clipper Gap Phase (*ca.* 5500–4500 BP), which is characterized by artifacts similar to those used during the Pre-Archaic. Based on observations from Monitor Valley, this period also appears to be characterized by large, wide, concave-base projectile points called "Triple T." Limited assemblages of artifacts from this time period suggest that the area was sparsely inhabited, possibly by small groups.

Middle Archaic Period (5000–1300 BP)

As during the earlier portion of the Archaic Period, remains of larger game tend to be found in archaeological contexts during the Middle Archaic Period, which is divided into the Devils Gate Phase (*ca.* 4500–3500 BP) and the later Reveille Phase (*ca.* 3500–1300 BP). The Middle Archaic Period is marked by the presence of large side-notched Gatecliff and Elko series projectile points, which slowly replaced the earlier Pinto and stemmed point forms. The use and exploitation of upland environments intensified during this time period, possibly in association with the exploitation of pinyon pine, which is postulated to have been introduced in the area around 6000 BP (Thomas 1982a:164).

Evidence from Gatecliff Shelter (Thomas 1983a) and Mount Jefferson (Thomas 1982b) indicates that the hunting of large game remained a dominant subsistence activity, as interpreted from the large numbers of Elko-style projectile points. However, more intense exploitation of a broad range of resources, possibly resulting from increased population, may have caused an increase in the presence of seed processing equipment. Incised stones are present in the Monitor Valley assemblages, and the appearance of exotic obsidian and marine shell beads suggests the presence of regional exchange (Thomas 1983a).

Divergence from the Middle and Late Archaic patterns is seen in the emergence in Utah and extreme eastern Nevada of the Fremont "cultures" during the Fremont/Parowan Period, *ca.* 1600 BP (Marwitt 1986). However, the degree of influence of the Fremont cultures with peoples in central Nevada is uncertain.

Late Archaic Period (1300 BP–Contact)

The Late Archaic Period is represented by the Underdown Phase (*ca.* 1300–600 BP) and the Yankee Blade Phase (600 BP–historic). This period is marked by important technological changes, which included the introduction of bow and arrow technology, as indicated by the presence of small corner-notched and basally notched projectile points

designated as part of the Rosegate series (Thomas 1981a). Because of the association of basally notched points with Fremont cultures, Thomas (1997) suggested that these artifacts may indicate a Fremont influence. During this time period occupation appears to be less intense, as marked by a decrease in overall numbers of artifacts and the production of bifaces at Gatecliff Shelter (Thomas 1983a).

The Yankee Blade Phase shows a marked divergence from earlier patterns. Projectile points from this phase are small Desert side-notched and Cottonwood series. Other than at the Alta Toquima residence sites (Thomas 1982b), these point forms are rarer in the Monitor Valley than the earlier Eastgate basally notched, Rose Spring corner-notched, and Elko forms. Resource exploitation intensified during this phase, with an increased focus on seeds, including pinyon pine. The discovery of more permanent habitation sites at higher altitudes indicates that groups became more sedentary, and that residences became established at locations that had served as temporary hunting camps during the preceding periods (Elston 1986). There is an increase in the size of houses and settlements. In the case of the Western Shoshone, large settlements appear in valley floors during the ethnohistoric (contact) period.

As noted above, a shift from the Middle and Late Archaic patterns is seen in the emergence of the Fremont "cultures" described by Marwitt (1986). No evidence of extensive use of the project area exists; however, southeast of the project area, Fremont style ceramics have been found near Cabin Spring, approximately 30 miles south of the project area (Russell 2004).

Small villages, ceramics, and some reliance on horticulture characterized the Parowan Fremont culture. As rainfall (necessary for agriculture) became more unpredictable, the Fremont may have abandoned agriculture in favor of a hunting-gathering adaptive strategy in the pinyon-juniper woodlands of western Utah and eastern Nevada, with a terminal date of *ca.* 650 BP (Wilde and Soper 1999:7). Another scenario proposed by Wilde and Soper (1999:7), based on evidence from Janetski (1994) and Madsen and Simms (1998), suggested that competition from foragers also may have been a factor in the shift to a more hunter-gatherer strategy.

It is also during this period that some see the arrival of *Newe* (Numic speakers and ancestral Shoshone). This period is marked by the presence of brownware ceramics, twined and coiled basketry, and small side-notched (Desert side-notched) projectile points. This is contrary to ethnographic accounts and oral tradition that indicate that the Western Shoshone have inhabited the region for a much greater period of time. The timing of the arrival of the *Newe* and the area from which they moved is widely debated (see Madsen and Rhode 1994), but current evidence suggests that they may have arrived *ca*. 1000 BP.

3.23.2.2.2 Historic Setting

The beginning of the historic-era in the Eureka County region is determined using rather arbitrary temporal and cultural markers. Although contact between European and American traders, trappers and explorers and the ethnographic Shoshone had been taking place since at least the early decades of the 19th century, sustained contact between Native and Euro-American populations did not occur until the 1850s and 1860s (Bailey 1966, James 1981).

As the population of Euro-American settlers and entrepreneurs increased in the Eureka County region, particularly following the Ruby Valley Treaty in 1863, several predominant economic patterns and themes of historical development emerged during the middle of the 19th century. The themes of particular relevance to Eureka County in general, and the 3 Bars Project area specifically, consist of early exploration, transportation and communication, early settlement, mining, charcoal production, and ranching and agriculture. Each of these topics is discussed below.

3.23.2.2.3 Early Exploration

The earliest recorded routes through Nevada were those made by fur trappers, and traders. American trapper Jedediah Smith, representing the Rocky Mountain Fur Company, struck out from the Great Salt Lake to Los Angeles in the summer of 1826, a journey that took him south along the Colorado River, then to the Mojave Valley, and finally into California (Elliot 1987, McBride 2002:2-4). In 1826, Peter Skene Ogden of the British-owned Hudson's Bay Company passed through northeastern Nevada in a prelude to his later exploration of the Humboldt River in 1828. In search of beaver hides, Ogden and his men left the Columbia River basin and traveled southeast until they discovered an "unknown" river, later named the Humboldt River, near Winnemucca. This route later became the main emigration corridor across Nevada (McBride 2002:2).

As the fur trading business declined, the U.S. government started taking an active interest in the West and began sponsoring explorations of the area. From 1843 through 1845, John C. Fremont, a lieutenant in the Army Topographical Corps, led several expeditions into Nevada as part of this government-sponsored program of exploration. During the expeditions, Fremont recognized that the area had interior drainage and understood its physiographical features, and thus named it the Great Basin (McBride 2002:7). In 1845, his route continued through the Diamond Mountains and through Diamond and Kobeh Valleys, a path that would have bisected the current project area.

In 1859, James Simpson, who had previously explored the area, led an expedition through central Nevada, from Camp Floyd, Utah, to Genoa, Nevada. Simpson noted that this route was not suitable for a railroad but would work well for wagons (Welch 1979:6, Vlasich 1981:228, McBride 2002:10–11). This route was later called the Central Route (also known as the Central Overland Trail and Egan-Simpson Wagon Route).

3.23.2.2.4 Transportation and Communication

As with virtually every other economic endeavor in Nevada, industries dealing with transportation and communication activities were established, at least initially, in reaction to the booming California and later Nevada mining industry in the middle 1800s. Emigrant and shipping routes were established early on for settlers and California-bound gold miners, but in large part these were intended only to provide passage through the state, and not to bring or support settlers. As Nevada's mining industry boomed, the state became a destination for travelers to the West.

3.23.2.2.5 Early Mail Delivery

Beginning in 1855, Major Howard Egan of the Mormon Battalion first traversed a route through central Nevada; 3 years later he surveyed the route for Major George Chorpenning. In 1859, this route was quickly adopted by Chorpenning's mail line, which used mules. Informally known as the "Jack-ass Mail," the operation was first established along the Humboldt River (Goetzmann 1966:293 *cited in* Bowers and Muessig 1982). By December 1859, Chorpenning had built several stations along the new route (Godfrey 1994). It is not known whether stations had been established within the project area. At the same time, Russell, Majors, and Waddell, owners of the Central Overland California & Pikes Peak Express Company (COC&PP Express Company), had been actively soliciting the U.S. Congress for the establishment of a 10-day mail service by pony express between Sacramento, California, and St. Joseph, Missouri, while at the same time laying out and establishing stations along the same route used by Chorpenning (Townley 1986:7–8, Godfrey 1994). In the wake of cash flow problems, Chorpenning's mail contract was terminated in May 1860, and was promptly awarded to the COC&PP Express Company. Russell, Majors, and

Waddell hoped that by demonstrating "that the central route offered the best opportunity for mail or stage…the firm could inherit the *(proposed route of the)* Pacific Railroad" (Townley 1986:8). This new subsidiary venture, more commonly known as the Pony Express Mail Service, began in April 1860.

Although short-lived (1860–1861), the Pony Express demonstrated the importance of a central route, which became even more important after the seizure of Butterfield's southern route by the Confederate army in January 1861 (Townley 1986:13). Although it was replaced by the telegraph just 18 months after it began, during its brief existence the Pony Express helped to deliver important information during a time of civil unrest.

The route of the Pony Express crosses the southern portion of the 3 Bars Project area, and three stations and one water source known to have been used by the Pony Express are within or immediately adjacent to the project boundary. From east to west, these are located at Sulphur Spring, Roberts Creek, Goodwin, and Grubbs Well. Additional stops in the project vicinity are Diamond Springs (Diamond City), on the east side of Diamond Valley, and Dry Creek, situated at the base of the Simpson Park Range.

3.23.2.2.6 Overland Stage

After the disbandment of the Pony Express, competition for government mail and passenger service contracts over the central route ensued between the COC&PP Express Company and Butterfield's Overland Mail Company. As a compromise, Congress awarded the COC&PP Express Company the eastern portion of the route from the Missouri River to Salt Lake City, where post and passengers were transferred to the Overland Mail Company (Overland Stage), which completed the first run to San Francisco on July 18, 1861 (Townley 1986:13, Hafen 2004 [1926]).

By the spring of 1862, the COC&PP Express Company had become financially stressed as a result of difficulties encountered with the management of the eastern end of the route, and its finances were in the hands of the courts. Finally, as a result of heavy indebtedness, the company was sold to Ben Holladay and the name was changed to the Overland Stage (Hafen 2004 [1926]:227–232).

A map of the Overland Stage and Pony Express routes across Nevada (Townley 1986:10–11) indicates that the Overland Stage followed the same route as the Pony Express through the project area. Within the project area, stations were located at Sulphur Spring, Roberts Creek, and Grubbs Well, with a watering stop at Goodwin.

In the latter part of 1866, Holladay disposed of his entire overland mail holdings, which included the Holladay Overland Mail and Express Company, the Overland Mail Company, and the Pioneer Stage Company. These were all absorbed by Wells, Fargo and Company, which had been founded in 1852 by Henry Wells, William G. Fargo, John Livingston, D. N. Barney, and others to conduct an express and banking business (Hafen 2004 [1926]:232–235).

As the Transcontinental Railroad neared completion, mail and coach service decreased, and even the Overland Telegraph was rerouted along the railroad, following the joining of the Central Pacific and Union Pacific railroads in May 1869. After the completion of the railroad, the central route for mail and passenger service was soon abandoned, with only interconnecting service between railheads remaining.

3.23.2.2.7 Transcontinental Telegraph

The telegraph line basically followed the route of the Overland Stage. Like the stage, its existence along the central route was short lived. Upon completion of the Transcontinental Railroad, the telegraph was quickly rerouted along the

Central Pacific Railroad. Service to southern Eureka County was provided by a line from Palisade along the Eureka and Palisade Railroad (E&PRR) to Eureka with additional service to mining camps surrounding Eureka.

3.23.2.2.8 Eureka and Palisade Railroad

With the completion of the Transcontinental Railroad through northern Eureka County, overland transportation took a dramatic turn. The largely isolated nature of central and eastern Nevada was rapidly coming to an end, and new markets for the industrial and agricultural/ranch products of the region soon emerged. At first wagon roads connected the area to the railroad. Later the E&PRR linked Palisade (a stop along the Central Pacific) and southern Eureka County, providing easy transportation to other population centers such as Salt Lake City.

As with most transportation development in the 19th century, the E&PRR was established in response to the development of mining. Upon establishment of the town of Eureka in 1870 and the development of mining, the lucrative, high-yielding lead and silver ore was transported by a fast wagon freight operation to the recently established Central Pacific railhead at Palisade (Paher 1970:181).

In 1874, a consortium of Isaac Requa, D.O. Mills, William Sharon, Thomas Bell, and Edgar Mills, who represented the Bank of California, the Virginia and Truckee Railroad, and various Comstock mining operations, took over the railroad (Myrick 1992:90). During the next 10 years the railroad was extremely prosperous, with connecting freight service to Belmont, Hamilton, Austin, Ward, and Pioche, Nevada, and plans were made to expand the line south. In the late 1880s mining began to fail in the Eureka area (Myrick 1992:107). Mark Requa, the son of Isaac, made a valiant effort to acquire additional business from other mines in the area, including the profitable copper mines near Ely, and at one point even contemplated extending the route east over four mountain ranges. A brief boom period occurred in 1905, however this short period of prosperity suffered a major blow in 1910 when major floods caused extensive damage to the line. In 1921, George Whittle purchased and reorganized the operation under the name of the Eureka-Nevada Railway Company. The line, operated under the leadership of John E. Sexton, made three runs per week. However, revenues began to decline in 1927 as a result of competition from growing highway traffic, and the railroad made its last run in September of 1938 (Myrick 1992:111).

Two sidings and two stations were located within the 3 Bars Project area. The sidings, Cedar and Oak, were used from 1934 to 1938 (Hall 1994). Pine Station is located just outside of Alpha. The Summit Station was a water stop located at the top of Garden Pass Summit.

3.23.2.2.9 Highway Development

As the 20th century progressed, railroads remained the primary means of moving people and goods within and through Nevada, but the automobile was fast becoming a major player on the transportation scene. However, in 1914, only 262 miles of Nevada's 12,812 miles of roadway were paved, and Nevada had a long way to go to provide for the automobile. An exception was the establishment in 1913 of the Lincoln Highway, which was one of America's first transcontinental automobile routes, beginning in Times Square in New York City and ending at the Palace of the Legion of Honor in San Francisco (USDOI National Park Service 2004).

The early route of the Lincoln Highway was determined primarily by the geography of Utah, where the Great Salt Lake Desert blocked the way west from Salt Lake City and limited funds were available for construction of a raised roadway across the barren salt flats. Because of this, the early route was routed around the south end of the desert to Ely, then on to Eureka. However, the popularity of this route began to decline after 1919. The final blow to the route through Eureka County was in 1927, when the Lincoln Highway Association abandoned the route through Ely and

Eureka for the Wendover Road. As a result, Nevada built an 80-mile route south to link up with the Lincoln Highway south of County Road 18 north of Ely. By the time the route was completed in 1930, the more direct Victory Highway (U.S. Highway 40) along the Humboldt River Valley had been improved sufficiently to capture most of the traffic traveling across the Great Basin.

3.23.2.2.10 Early Settlement

Early settlement within and in the vicinity of the 3 Bars Project was limited to scattered ranches consisting of Denay, Pennsylvania (currently known as the McClusky Ranch), Grubb Meadows Ranch (currently known as the 3 Bar Ranch), and the Addinton Ranch. Of these early ranches, the 3 Bar and McClusky Ranches were established and are still in the western portion of the project area. The initial operations of these early ranches were geared primarily toward trapping mustangs and driving them to California (Wooley 1999).

3.23.2.2.11 Mining

The economic and social development of central Nevada during the 19th century was more closely associated with the emergence of the mining industry than with any other activity. In fact, the existence of Nevada as an independent state is primarily the result of the wealth of the Comstock Lode, which helped convince the U.S. Congress and President Abraham Lincoln to create this new territory from the western section of Utah in 1861. After the Civil War, and throughout the latter decades of the 19th century, mining continued to be the single most important economic endeavor throughout the state, although the boom-and-bust cycles intrinsic to the industry kept the population of much of Nevada at a very low level until the early 20th century (Hulse 1990).

Roberts and Montgomery (1967) depict five mining districts—Alpha, Lone Mountain, Mount Hope, Antelope, and Roberts—within the project area, and another six to the north and southeast. Several smaller areas of mining activity also existed historically; all are discussed below. Those in the project area vicinity include the Cortez/Mill Canyon, Buckhorn, Mineral Hill, and Union Districts to the north and the Eureka and Fish Creek Districts to the south. Although mining is represented within the project area, historically it does not compare in size and scope to operations at Eureka and Ruby Hill south and southeast of the 3 Bars Project area, and the Mineral Hill and Cortez Districts north of the project area.

3.23.2.2.12 Charcoal Production

The production of charcoal and cordwood was one of the area's most significant industries historically, and it resulted in substantial changes to the environment as it existed before 1850. The furnaces of the Eureka mining district, as well as those at other mines in the area, required tremendous quantities of charcoal. In addition, cordwood and lumber were needed for other mining and industrial purposes such as construction. Pinyon-juniper cordwood was also used for fuel by the E&PRR until 1890, when the railroad switched to coal (Zeier 1985:18).

By far the largest single consumer of charcoal was the Eureka mills. In 1880, at the height of mining within the Eureka District, the mills consumed a total of 1.25 million bushels of charcoal. Young and Budy (1979:117 *cited in* Zeier 1985:18) stated that "the demand for charcoal was so great that deforestation became a severe problem" with 4,000 to 5,000 acres of woodland cut annually. By 1878, the average hauling distance from (charcoal) pit to smelter was 35 miles.

3.23.2.2.13 Ranching and Agriculture

Given the region's generally arid climate and landscape, traditional crop farming was never a major industry in Eureka and surrounding counties, and growing fruits and vegetables never expanded much beyond small-scale local operations. Early settlers in the area were actively engaged in rounding up mustangs, an endeavor that continued into the 20th century. However, cattle and sheep ranching proved to be highly profitable endeavors, especially during the boom periods of the mining industry, when tens of thousands of hungry miners flooded the region during the middle and latter decades of the 19th century.

Ranching

Cattle and sheep grazing have long been the mainstays of the agricultural industry in central Nevada. However, they occur within a marginal environment where severe weather conditions, particularly in the winter, and rangeland vegetation that can only support a few head per acre limit the scope and degree to which grazing can be supported (Bowers and Muessig 1982:77). The first domestic cattle documented as having at least passed through eastern Nevada came with the Bartelson-Bidwell party in 1841, but as an industry, cattle ranching did not develop in central Nevada until after the Civil War. By the mid-1860s, stockmen were driving thousands of head into the region (Mack and Sawyer 1965 *cited in* James 1981; Patterson 1965). However, as with mining in Eureka and surrounding counties, cattle-raising went through its own boom-and-bust cycles.

The first sheep to enter Nevada followed the Old Spanish Trail from New Mexico through southern Nevada into California. This drive, consisting of 25,000 head, was organized by Miguel Otero, a rich landowner whose son would later become the governor of New Mexico, and Jose Luna, one of the richest sheep owners in the state. The second sheep drive was organized by "Uncle Dick" Wootton, with 9,000 head that took a northerly route along the Humboldt River in 1852 (Georgetta 1972:7-15).

Beginning in the 1870s, Scandinavian, Irish, and Scottish immigrants became engaged in the raising of sheep, which greatly intensified in the 1890s with the arrival of the Basque, who had moved from California following a period of drought. Because of their competition for grazing land, cattle ranches sought to control sheep grazing through the creation of grazing laws (Creel 1964). The fact that sheep cropped the land so closely caused former ranges to lose their plant growth, thereby rendering areas useless for cattle grazing (James 1981:258–260). It was not until 1934 with the passage of the Taylor Grazing Act that the management problem was adequately addressed. In 1946, the BLM was organized from the Grazing Service and General Land Office (Clawson 1950:100). Sheep grazing within the 3 Bars Project area specifically was conducted by the Damele Brothers (Georgetta 1972:442).

Agriculture

Because of the limited availability of water, the remoteness of the area, and harsh winter conditions, agriculture has always been conducted on a limited basis in most areas of Nevada, including Eureka County, and even then has primarily been geared toward serving local markets such as mining camps and towns. Bowers and Muessig (1982) provide numerous examples from the Reese River area, the Monitor and Big Smoky Valleys, and the current project area of crops that met local demands, alleviating the high cost of importing fruits and vegetables from California, Utah, or the valleys of western Nevada. In 1879-1880, the Eureka County Assessor reported production of onions, cabbage, corn, potatoes, carrots, parsnips, tomatoes, beets, and turnips (Nevada Surveyor General and State Land Register 1880:34–35 *cited in* Bowers and Muessig 1982:78). However, this trend in the production of local vegetables decreased during the 1880s as the first mining boom came to an end (Hardman and Mason 1949:24 *cited in* Bowers

and Muessig 1982:78–79). Hardman and Mason (1949:24) indicated that as the early boom period in mining declined, so did the acreage used in the production of fruits and vegetables. They attribute this to the lack of irrigation, the remoteness of the area, and the high cost of transportation to markets outside of the area.

Wild Horse Industry

The trapping of wild horses has been a continuing industry since settlers began arriving in the 1850s, and at first met the large demand for horses in California during the Gold Rush. Those who were engaged in the capture of mustangs became known as mustangers.

In the late 1890s it was estimated that 80,000 wild horses roamed in eastern Nevada within the area encompassed by White Pine, Lander, Elko, Nye, and Eureka Counties (Amaral 1976:20). Shortly thereafter, there was a large demand for horses from the Quartermaster Remount Service. Established in 1908 to procure horses for military transportation, the service procured approximately 571,000 horses during World War I. Agents from the Quartermaster Remount Service were stationed in Austin, Battle Mountain, and Elko, as well as other Nevada locations.

After World War I, the demand for horses for use as pet food increased, and large numbers were captured and shipped via rail to the East Coast for processing. Horse meat originally canned for pet food was also known to have been consumed by humans during the Great Depression. After World War II, the pet food industry continued to expand to the point that the wild horse population was decimated. Finally, in 1971 legislation was passed that ended both the legal and the unregulated roundup of wild horses. Since then the BLM has developed a program of range management that is designed to keep the population of wild horses in check.

3.23.2.3 Documented Cultural Resources

3.23.2.3.1 Previous Studies and Surveys

A total of 345 cultural resource investigations have been conducted within the vicinity of the project area. With the exception of linear cultural resource surveys, these investigations have primarily been focused within the Roberts and Simpson Park Mountains, and constitute approximately 16 percent (121,845 acres) of the project area (**Figure 3-51**).

Cultural remains have been found at many locations on the landscape and demonstrate that people—indigenous peoples followed by European-Americans—have resided in the 3 Bars Project region for at least 8,000 years. A detailed summary of the documented resources by theme is presented in *Cultural Context 3 Bars Ecosystem and Landscape Restoration Project* (AECOM 2012).

Within the 3 Bars Project area, investigations have resulted in the documentation of 1,109 resources, 354 of which are isolated finds. The remaining 755 cultural resource sites, summarized in **Table 3-62**, have varying characteristics and have been subjected to various levels of significance assessment; approximately 36 percent of the sites have not been evaluated for NRHP eligibility.

- 536 sites reflect early Native American sites and artifacts, including 7 resources that appear to represent ethnohistoric usage including 6 with prehistoric and historic components.
- 219 sites reflect historic-era land use. These sites consist of the remains of early trails, transportation routes, and communication systems and reminders of historic-era mining and related charcoal production and ranching and sheepherding activities.

- 52 sites contain evidence of both prehistoric and historic-era land uses.

3.23.2.3.2 Documented Prehistoric Sites, Features, and Artifacts

The area is known to contain evidence of activities that occurred from the Early Archaic Period through the more recent Native American (Western Shoshone) period. Resources identified by prehistoric temporal periods are summarized in **Table 3-63**. The resources are discussed by temporal period; numerous cultural sites contain the remains of prehistoric occupations that span multiple periods of time over several temporal periods.

Early Archaic

Based on the presence of Pinto and stemmed projectile points, seven Early Archaic sites or site components have been identified within the project area. With the exception of 26EU1272, which is just north of U.S. Highway 50, all are within or immediately north of Roberts Mountains. Two of these sites have not been evaluated for eligibility for listing in the NRHP, three have been recommended as not eligible, and two appear eligible for inclusion in the NRHP.

TABLE 3-62

Summary of Documented Resources

Site Type	Eligible Sites	Not-Eligible Sites	Unevaluated Sites	Total
Prehistoric	85	240	152	477
Prehistoric/Historic	27	8	17	52
Total Prehistoric Sites	**112**	**248**	**169**	**529**
Ethnohistoric/Prehistoric	4	0	0	4
Ethnohistoric/Historic	2	0	0	2
Ethnohistoric	0	0	1	1
Total Ethnohistoric Sites	**6**	**0**	**1**	**7**
Historic	76	54	89	219
Grand Totals	**194**	**302**	**259**	**755**

Middle Archaic

Of the sites that can be associated with a particular prehistoric period, the majority (116) contain Middle Archaic markers, Elko and Gatecliff style projectile points. Given the large number of sites dating to this time period, it appears that this time frame shows a large increase in the intensity of prehistoric land use during the Middle Archaic, and most likely an associated increase in population. Almost half of these resources (51) have been recommended as eligible for inclusion in the NRHP, 37 appear not to be eligible, and 28 are unevaluated. With the exception of five sites located in the southern portion of the project area, north of U.S. Highway 50, the remaining sites are distributed along the upper fans and higher elevations within Roberts Mountains and the southern end of the Simpson Park Mountains. Three of these sites also contain Early Archaic components, indicating some reuse of locations from the earlier time period. The vast majority of the 116 sites (97 sites) consist entirely of lithics, 11 sites also contain ground stone, 6 appear to represent at least short-term habitation based on the presence of fire-cracked-rock and/or hearth features, and lithics with rock circles are present at two sites.

Late Archaic

A total of 54 Late Archaic sites defined by the presence of Rose Spring and Eastgate style projectile points have been defined primarily within the Roberts Mountains area, although a small number are also located north of U.S. Highway 50 in the southern portion of the project area. More than half of these sites (28) also contain Middle Archaic components, indicating reuse of locations from the earlier period, and the remaining 26 sites represent expansion of land uses and the assumed increase in the intensity of resource procurement. The majority of these sites (27 sites) appear eligible for listing in the NRHP, 9 are unevaluated, and 18 have been recommended as not eligible.

TABLE 3-63

Summary of Documented Prehistoric Cultural Sites

Site Type	Eligible	Not Eligible	Not Evaluated	Total
Early Archaic	2	3	2	7
Middle Archaic	51	37	28	116
Late Archaic	27	18	9	54
Numic Occupation	7	11	14	32
Unknown Prehistoric	39	192	118	349
Totals	**126**	**261**	**171**	**558**[1]

[1] Multiple occupations/time periods are represented at 34 sites.

Numic Occupation

Numic occupation, implied from the presence of desert series projectile points and/or brownware ceramics, is present at 32 locations. With the exception of site 26EU353, which is at the southern end of the project area, these sites tend to be located within the pinyon-juniper zone of Roberts Mountains. Seven of these sites have been recommended as eligible for listing in the NRHP, 11 as not eligible, and 14 have not been evaluated. Reuse of locations from the Middle Archaic Period and/or earlier part of the Late Archaic Period is documented at 14 of these 32 sites. As with sites from the Middle and Early portions of the Late Archaic Period, 19 of these sites consist of lithic materials only. Complex constituents, including hearths (suggesting campsites), are located at three sites; three resources contain lithics and ground stone, seven contain brownware ceramics, and one site has an associated rock ring.

Unknown Prehistoric

A total of 353 prehistoric sites or site components lacking temporal markers that would place them within a specific time frame have been identified and documented. The majority (328) contain only flaked stone. Five of these sites appear to be opportunistic quarry locations, and eight sites possess flaked and ground stone artifacts. The remaining 24 sites consist of hunting blinds (4 sites), rock rings or flaked stone with rock ring features (7 sites), lithics and burned bone and/or hearth features (5 sites), lithics and bedrock mortars (1 site), and one complex rock shelter site with flaked stone, fire-cracked rock, and ground stone. Approximately one-third (118) of these sites have not been evaluated, more than half (192) have been recommended as not eligible for listing in the NRHP, 39 resources have been recommended as eligible, with the evaluation pending additional assessment at 4 of these sites. This resource type is primarily clustered within the Roberts Mountains area.

3.23.2.3.3 Documented Historic-era Sites and Features

Historic-era enterprises in the region have also left their marks on the landscape, such as the routes of the Pony Express, Overland Stage and Transcontinental Telegraph, and the E&PRR, and various mining ventures and associated charcoal production, and ranching operations, some of which date to early settlement of the region (**Table 3-64**). A review of these and other important developments provides a cultural background against which to define the context for the historic-era events that shaped the natural environment into the mosaic that exists today. Cultural resource sites that reflect early exploration have not been identified within the project area.

TABLE 3-64

Summary of Documented Historic-era Cultural Sites

Site Type	Eligible	Not Eligible	Unevaluated/Incomplete Evaluations	Total
Pony Express/Overland Stage/Telegraph Route	0	0	7[1]	7
Transportation	6	7	2	15
Communication	2	0	2	4
Early Settlement/Ranching	2	0	12	14
Mining	5	12	1	18
Charcoal Production	81	4	28	113
Ranching and Agriculture	5	6	8	19
Unassociated Historic Sites	0	39	40	79
Totals	**101**	**68**	**100**	**269[2]**

[1] The Pony Express National Historic Trail is considered nationally significant and only segments are unevaluated/incomplete.

[2] Includes 50 sites with prehistoric or ethnohistoric components.

3.23.2.3.4 Summary of Identified Resources - Transportation and Communication

This theme is represented by the routes of the Pony Express, Overland Stage, Lincoln Highway/Austin-to-Eureka Stage, Transcontinental Telegraph, and the E&PRR, and historic roads, telegraph and telephone alignments. Seven resources associated with the Pony Express/Overland Stage and Transcontinental Telegraph route have been documented in the southern portion of the project area, and all are classified as unevaluated. The route of the Austin-to-Eureka Stage and Lincoln Highway is immediately north and south of U.S. Highway 50, and has been recommended as not eligible for listing in the NRHP. Three of the four historic road segments are situated on the southwest flank of Roberts Mountains and are also listed as not eligible. An alignment of the Old State Route 21 is near the northern boundary of the project area and is listed as eligible.

As part of the mitigation to offset indirect visual impacts and direct impacts on the remains of the E&PRR resulting from construction of the Falcon transmission line project, Summit Envirosolutions, Inc., documented nearly the entire length of the E&PRR (McQueen et al. 2009). Within the project area the route is represented by the railroad line,

workcamps with historic refuse, an historic structure, and the remains of Chimney's (Alpha) Station, Summit Station, and Deep Wells Station. The historic structure and Chimney's Station have not been evaluated, the Deep Wells site has been recommended as not eligible for listing in the NRHP, and the remaining elements of the route have been recommended as contributing elements. Four additional resources include the remains of telegraph and telephone lines, one of which is unevaluated, and one is the remains of the McClusky Peak toll station line, which along the western project area boundary and has not been evaluated for eligibility. The other two resources include the remains of the telephone line extending to the Three Bars Ranch, which has been recommended as eligible for listing; the remaining site consists of three unevaluated segments of a telegraph line that parallels the west side of Tonkin Road near the northern end of the project area. Although no remains of the transcontinental telegraph have been documented, the route most likely paralleled the route of the Pony Express/Overland Stage.

3.23.2.3.5 Summary of Documented Resources - Early Settlement/Ranching

The archaeological manifestations of early settlement are represented by signs of early ranching within the project area and consist of 14 resources. Ten sites documented in the project area reflect named early settlements/ranches—the Sadler, Tonkin, and Willow Creek ranches, Walti Hot Springs, Bartine Ranch, Indian Ranch, and Peretti's, Ferguson, Andrew Louck, and Isaacs ranches. In addition, the remains of four other unnamed resources appear to be the remains of early ranches/settlements. With the exceptions of the dugout with historic refuse and Andrew Louck's Ranch, which have been recommended as eligible for inclusion in the NRHP, the remaining ranches or remains of ranches have not been evaluated.

3.23.2.3.6 Summary of Documented Resources - Mining

A review of the previously documented sites indicates that the remains of 18 mines or mining-associated cultural resources have been documented within the project area. These resources are somewhat clustered in the vicinity of Mount Hope, with the remainder consisting of one on the southwest flank of Roberts Mountains, one in the Simpson Park Mountains, and another at Lone Mountain. Mines and mining camps, including the remains of the Mount Hope and Keystone Mines, represent ten of the documented resources. The Mount Hope Project and another resource consisting of adits and tailings have been recommended as not eligible for listing in the NRHP; the remaining sites are unevaluated.

The remaining eight sites consist of prospect pits, refuse deposits (one of which appears to be associated with a Chinese occupation), cairns, a quarry, and a trail. With the exception of the trail that has not been evaluated and the quarry and Chinese occupation site, which have been recommended as eligible, all of the remaining mining resources have been recommended as not eligible for inclusion in the NRHP.

3.23.2.3.7 Summary of Identified Resources - Charcoal Production

Consisting of 113 resources, the remains of charcoal production are well represented in the 3 Bars Project area. The majority of these resources are in the southern Roberts Mountains, and the remaining sites are scattered in the uplands throughout the northern half of the project area. With the exception of seven resources consisting of associated refuse, a road, a logging skid trail, and piles of ax-cut wood, all of these documented resources contain the remains of charcoal platforms, and 26 sites appear to be the remains of camps. The majority of the sites (81 sites) appear eligible for inclusion in the NRHP, 28 have either not been or are only partially evaluated, and 4 sites remain unevaluated.

A treatment plan was developed and implemented to mitigate adverse effects on 13 historic properties located within the Gold Bar II Mine Project, which were determined by the Nevada State Office of Historic Preservation to be contributing elements to the Roberts Mountains Carbonari District, part of the Eureka Charcoal District. This treatment plan consisted of detailed documentation of 31 charcoal platforms, 9 distinct habitation loci, and 1 trash dump (Reno et al. 1994:i–ii).

3.23.2.3.8 Summary of Cultural Resources - Ranching and Agriculture

Although ranching, sheepherding, and the wild horse industry are represented by documented cultural resources within the project area, resources specifically associated with agriculture have not been identified. As mentioned above, "Early Settlement" is represented by the ranches or the remains of early ranching settlements at 14 locations. The remaining 15 ranching-related resources consist of fences and rock walls (4 sites), ranching-related refuse (3 sites), 2 roads, and 6 miscellaneous ranching-related features (e.g., depressions, corrals, a well, a sheep camp, and log troughs). Five of these sites have been recommended as not eligible for listing in the NRHP and the remaining ten either have been recommended as not eligible (six) or have not been evaluated (four).

Two sites with aspen tree carvings associated with Basque sheepherding have been documented within the project area. Both sites are located within the Simpson Park Mountains in the western portion of the project area, and have been recommended as not eligible for listing in the NRHP.

Two horse traps or blinds have been documented within the project area. One, located on the northwest flank of Roberts Mountains, appears eligible for listing in the NRHP; the other, in Pine Valley, has not been evaluated.

3.23.2.3.9 Summary of Cultural Resources - Unassociated Historic Sites

A total of 79 documented historic cultural resources sites are lacking the data necessary to determine their association with historic-era themes. The majority (65) of these 79 sites consists of historic-era refuse; none of these sites have been recommended as eligible for listing in the NRHP, 29 appear not eligible, and 36 are unevaluated. The remaining 14 resources consist of features such as spring improvements, wagon parts, a fence, a boundary line, a historic campsite, rock walls, logging isolates, a rock shelter with stacked rocks, a log building, rock rings, a schoolhouse, a stone dam, a structure of unknown function, and wooden poles. With the exception of the log building, schoolhouse, wooden poles, and the unknown structure that have not been evaluated (four sites), the remaining ten sites have been recommended as not eligible for listing in the NRHP.

3.23.3 Environmental Consequences

3.23.3.1 Key Issues of Concern Considered during Evaluation of the Environmental Consequences

Several issues of concern have been identified by the BLM in the AECC and through scoping. These would not be addressed directly by the restoration treatments, but could be dealt with indirectly through surveys and studies conducted on treatment areas prior to treatment. These are:

- Site management is currently "piecemeal," resulting in fracturing of the historic landscape and loss of integrity of cultural resources.

- Approximately 84 percent of the 3 Bars ecosystem has not been inventoried for the presence of prehistoric and historic-era resources that may be eligible for inclusion in the NRHP or which may be contributing elements to a historic cultural landscape.
- A large number of previously identified cultural resources have not been evaluated for inclusion in the NRHP.
- The physical, historic remnants of the Pony Express Trail have not been fully inventoried or evaluated to identify related segments or sites that may eligible for the NRHP.

3.23.3.2 Significance Criteria

Federal historic preservation legislation provides a legal environment for the documentation, evaluation, and protection of archaeological and historic sites that may be affected by federal undertakings, by private undertakings operating under federal license, or on federally managed lands. The significance criterion used to evaluate the impacts of the alternatives on cultural resources is whether any action would adversely affect historic properties unevaluated or eligible for inclusion in the NRHP.

The NRHP eligibility of cultural resources is determined by applying the criteria outlined in 36 CFR § 60.4 (see Regulatory Background Section 3.23.1). In addition to having eligibility related to one of the four criteria, a cultural resource must also retain sufficient physical integrity to convey its importance. The National Register has defined seven elements of integrity—Location, Design, Setting, Materials, Workmanship, Feeling, and Association.

For the 3 Bars Project, the NRHP eligibility criteria were further refined into research domains for prehistoric and historic-era sites. Five research themes were defined for the prehistoric period resources and consisted of Paleoenvironment, Geomorphology and Chronology, Lithic Technology, Settlement and Subsistence, and External Relations and Exchange (AECOM 2012). For historic-era properties, the themes consist of Early Exploration, Transportation and Communication, Early Settlement, Mining and Associated Charcoal Production, and Ranching and Agriculture.

Impacts to cultural resources were assessed in light of the degree to which the project may adversely affect cultural resources eligible for listing in the NRHP, or unevaluated resources that may potentially be eligible for listing. Under 36 CFR Part 800 (regulations for implementing the National Historic Preservation Act), "An adverse effect is found when an undertaking may alter, directly or indirectly, any of the characteristics of a historic property that qualify the property for inclusion in the National Register in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association." Adverse effects can include physical disturbance or alteration of a property or its setting, visual, atmospheric, and auditory intrusions, removal of a building or structure from its historic location, and deterioration through neglect. Any adverse effect identified under the National Historic Preservation Act criteria is also considered to be a significant adverse impact under NEPA.

3.23.3.3 Direct and Indirect Effects

3.23.3.3.1 Direct and Indirect Effects Common to All Action Alternatives

Adverse Effects

Historically, there have been potential direct conflicts between land restoration treatments and archaeological/cultural resources, and specific impacts to known and undiscovered cultural resources can be severe. For example, surface-

disturbing activities may destroy spatial context as well as damage or destroy individual artifacts, features, and structures. Cultural properties consisting only of surface manifestations could be destroyed or severely affected during surface-disturbing activities.

Beneficial Effects

Stabilization and restoration of riparian systems would reduce streambank erosion and would ensure that buried cultural and paleontological resources adjacent to streams remained intact. Surveys would be conducted to identify the locations of cultural and traditional resources prior to treatment activities to ensure that these resources would be protected.

3.23.3.3.2 Direct and Indirect Effects under Alternative A (Preferred Alternative)

Riparian Treatments

Cultural resource investigations have been conducted on the Black Spring, Indian Creek Headwaters Middle, Mud Spring, Garden Spring, Roberts Mountain Spring, Trail Spring, Lower Henderson 1, Vinini Creek, Upper Vinini Creek, Upper Willow, Roberts Creek, Willow Creek, Denay Pond, Lone Spring, and Treasure Well units. Fifteen investigations have resulted in the identification of 23 cultural sites. Seventeen sites have either been determined eligible for inclusion in the NRHP or have not been evaluated for NRHP eligibility. The remaining six sites have been determined not eligible for NRHP listing.

Adverse Effects

Manual methods would result in general surface disturbance that could disrupt the spatial context of archaeological constituents, mulching with organic materials would compromise radiometric dating, and the use of hard-edged tools could damage artifacts. There is also the potential for unauthorized collection of artifacts by workers. Although the removal of vegetation has the potential to expose archaeological components, and thereby increase the possibility of vandalism and/or unauthorized collection of artifacts, monitoring during project implementation would significantly reduce the risk of unauthorized collection. Cultural inventories conducted in accordance with the *Programmatic Agreement between the Mount Lewis Field Office of the Bureau of Land Management and the Nevada State Historic Preservation Officer regarding National Historic Preservation Act Compliance for the 3 Bars Ecosystem and Landscape Restoration Project, Eureka County, Nevada* (Programmatic Agreement) would result in the identification of historic properties, thereby allowing avoidance (see **Appendix B**). Because inventory and site assessment would be conducted prior to project implementation and all eligible or unevaluated resources would be avoided, there would be no direct adverse effects to cultural resources.

Use of chainsaws to remove pinyon-juniper should have little or no effect on cultural resources. Because of the limited scope and small size of the acreage that would be treated with manual methods, however, manual methods may do little to reduce the potential for wildfires that could result in severe impacts to cultural resources either from the fire, fire suppression activities, or the indirect effects associated with the increased potential for erosion as a result of catastrophic wildfire, and which have the potential to more significantly compromise the integrity of archaeological deposits.

The use of a track hoe or back hoe for stream channel restoration would result in surface and shallow subsurface disturbances that would likely introduce organic materials to lower soil layers, thereby contaminating any surface or shallow subsurface cultural resource sites that contain early historic or prehistoric datable organics, such as charcoal,

wood, or preserved plant materials. Surface and shallow subsurface impacts would also include horizontal and vertical displacement of the upper portion of soils where archaeological resources could be contained, potentially compromising depositional context and integrity, and damaging or destroying artifacts (USDOI BLM 2007c:4-107).

Beneficial Effects

Stabilization and restoration of riparian systems would reduce streambank erosion and ensure that cultural and paleontological resources buried near streams remained intact. Uncontrolled wildfire has the potential to significantly impact cultural resources, and the reduction of fuels that would contribute to such events is one of the goals of the 3 Bars Project. Stream channel restoration and removal of pinyon-juniper and noxious weeds and other invasive non-native vegetation from riparian zones would improve stream functionality and encourage the growth of fire-resilient vegetation, which would enhance the ability of the riparian zone to function as a fuel break.

Aspen Treatments

An inventory conducted at RM-A2 documented a site with historic features and prehistoric flaked stone that has been recommended as eligible for inclusion in the NRHP.

A Class III cultural resource inventory would be conducted prior to treatment to reduce the potential for treatments to adversely affect historic properties. Inventory, assessments of NRHP eligibility, and avoidance of adverse effects are outlined in the stipulations of the Programmatic Agreement prepared for the 3 Bars Project, and would meet the requirements of Section 106. Improvement in the health of aspen stands, and removal of pinyon-juniper near aspen stands to create fire breaks, would help to reduce the risk of wildfire spread. These treatments, however, would do little to reduce the long-term risk to archaeological and other cultural resources from wildfire as few acres would be treated annually in aspen stands.

Pinyon-juniper Treatments

Twelve cultural resources investigations have been conducted within portions of the Atlas, Cottonwood/Meadow Canyons, Dry Canyon, Gable Corridor, Henderson Corridor, Sulphur Spring Wildfire Management, Three Bars Ranch, Tonkin North and South, Upper Roberts Creek, Vinini Corridor, and Whistler units. These resulted in the documentation of 189 cultural sites, of which 71 were recommended and/or determined to be not eligible for inclusion in the NRHP, 71 were determined eligible, and 47 were unevaluated. Dominant cultural resources include prehistoric open lithic scatters and historic resources associated with charcoal production. Historic-era resources represent all themes including the built environment consisting of historic structures and ranches. A segment of the Pony Express Trail is within the Henderson Corridor Unit.

Adverse Effects

The types of adverse effects from manual, mechanical, and prescribed fire treatment methods, and from the use of small, temporary exclosure fencing, would be similar to those discussed under Effects Common to All Alternatives, and under Riparian Treatments. The greatest risks to cultural resources would be from mechanical and fire treatments.

Root plowing, tilling and drill seeding, mowing, roller chopping and cutting, blading, grubbing, and feller-bunching could damage surface and subsurface cultural resources if the sites were not avoided. Treatments could compromise depositional context and integrity, and damage or destroy artifacts.

Several thousand acres could be burned annually using prescribed fire and wildland fire for resource benefit. The effects of fire on cultural resources would vary depending on temperature and duration of exposure to heat. Generally, higher temperature and/or longer exposure to heat increases the potential for damage to cultural resources. As a general rule, fire does not affect buried cultural materials. Studies show that even a few inches of soil cover are sufficient to protect cultural materials. However, there are times when conditions do carry heat below the surface, with the potential to affect buried materials.

Stumps that smolder and burn have the potential to affect nearby buried materials. Heavy duff, surface logs, and roots that smolder and burn have the potential to expose subsurface materials to heat over a period of time, and hence have the potential to affect cultural materials. Fires that burn hot and fast through a site may have less of an effect on certain types of cultural materials than fires that smolder in the duff, or than logs that burn for a period of time (USDOI BLM 2007c:4-104). Fire can cause physical damage to sites from snags/trees falling on them, and can indirectly lead to loss of archaeological data due to increased damage from rain, changes in drainage patterns, soil erosion, and flooding (USDOI BLM 2007c:4-107).

Wildfire is generally more destructive to cultural resources than prescribed fire, since it results in effects from both uncontrolled fire and fire suppression. Management decisions may need to balance the potential effects of a prescribed burn with the risk of damage from an uncontrolled wildfire. Because prescribed fire can be controlled, cultural resource specialists could work with fire managers to determine the predicted temperature and duration of a fire through an area, and possibly to modify burn plans to minimize effects to cultural resources. The emergency nature of wildfires can lessen management's ability to prioritize conservation of cultural resources.

Protecting cultural resources during fire would begin with fire management planning. During planning, the BLM would define vulnerable cultural resources by classes of site-types and specific sites, identify appropriate protection measures for them, and identify appropriate management responses with regard to cultural resources in the event of fire. Consultation with State Historic Preservation Office, Tribes, and other appropriate entities should be part of the project planning process, especially when designing fire-specific protocols for identification and protection of potentially affected cultural resources (USDOI BLM 2007c:4-105).

Beneficial Effects

Cultural inventories conducted in accordance with the Programmatic Agreement established for this project would result in the identification and avoidance of historic properties. This assessment would also include determination of eligibility of a portion of the Pony Express route mentioned above. The Pony Express route is Congressionally designated as a National Historic Trail, thus it is anticipated that the NRHP assessment may include consultation and concurrence with the National Park Service. Because inventory and site assessment would be conducted prior to project implementation and all resources would be avoided, there would be no direct adverse effects to cultural resources. Although the removal of vegetation has the potential to expose archaeological components, and could thereby increase the possibility of vandalism and/or unauthorized collection of artifacts, monitoring during project implementation would significantly reduce the risk of unauthorized collection.

Given the large number of acres that would be subject to treatment, together these methods would significantly reduce hazardous fuels and the risk of an uncontrolled catastrophic wildfire that could adversely affect historic properties. Therefore, pinyon-juniper treatments would result in significant long-term benefits and protection of cultural resources from catastrophic wildfire.

Sagebrush Treatments

Eleven investigations have been conducted on portions of the Alpha, Coils Creek, Kobeh East, Nichols, Roberts Mountain Pasture, Rocky Hills, South Simpson, Table Mountain, Three Corners, West Simpson Park, and Whistler Sage units. These studies have documented 27 cultural sites, of which 5 have been determined not eligible, 3 have been determined eligible, and 19, including a portion of the Pony Express route, have not been evaluated for NRHP eligibility. Two of the eligible sites are components of the E&PRR, which has been completely documented. These sites would require mitigation if it is not possible to avoid them during project implementation.

Adverse Effects

Manual and mechanical treatments could be used in all areas and the potential for adverse effects would be the same as Effects Common to All Alternatives and effects from pinyon-juniper treatments.

Livestock could to be used on the 3 Bars Project area to remove cheatgrass. While grazing animals could displace and damage artifacts and generally compromise the integrity of surface archaeological deposits, use of livestock would be limited to small treatment areas and would most likely not affect historic properties.

Beneficial Effects

Adherence to the stipulations outlined in the Programmatic Agreement would ensure that historic properties are not subject to adverse effects. The greatest inadvertent threat to cultural resources would be associated with uncontrolled wildfire, and these effects have the potential to be severe. However, treatments would reduce fuel loads and fuel breaks would aid in protecting historic properties from uncontrolled catastrophic wildfire, resulting in long-term beneficial effects.

3.23.3.3.3 Direct and Indirect Effects under Alternative B (No Fire Use Alternative)

Mechanical and fire treatments have the greatest potential for harming cultural resources. The number of acres treated using manual and mechanical equipment would be similar to that under Alternative A. Prescribed fire and wildland fire for resource benefit would not be used on several thousand acres annually, as they would under Alternative A. Fire has the potential to cause inadvertent effects to cultural sites. By removing fire under this alternative, these risks would be substantially less under Alternative B than under Alternative A.

Under Alternative B, the BLM would be unable to restore fire as an integral part of the ecosystem. It is unlikely that the BLM would be able to slow the spread of noxious weeds and other invasive non-native vegetation, including cheatgrass. Cheatgrass is a major contributor to providing fuel for wildfire. It is unlikely the trend toward large-sized fires of moderate to high severity in sagebrush and large stand-replacing fires in pinyon-juniper would slow or reverse in the long-term, which would continue to be a threat to historic properties.

3.23.3.3.4 Direct and Indirect Effects under Alternative C (Minimal Land Disturbance Alternative)

Given that mechanical and fire treatments, and to a lesser extent biological treatments using livestock, have the greatest potential to harm cultural sites, these risks would be eliminated under this alternative. However, large numbers of workers and their vehicles would be needed to accomplish proposed treatments under this alternative. Vehicle miles traveled would likely be greatest under this alternative and vehicles could crush cultural materials. Increased numbers of workers could increase the potential for looting. Downed trees and slash material from

treatments would be difficult to remove without mechanical equipment or pile burning. Some downed wood and slash could be sold or made available to the public as firewood.

The number of miles of fire and fuel breaks created under this alternative would be substantially less than under Alternatives A and B as the BLM would not be able to use mechanical equipment, such as bulldozers, mowers, and mulchers, and prescribed fire to create fire and fuel breaks. Fire and fuel break treatments would primarily be limited to stream and aspen habitats, or near roads, where pinyon-juniper would be removed to enhance or create new breaks.

Under Alternative C, it is unlikely the trend toward large-sized fires of moderate to high severity in sagebrush and large stand-replacing fires in pinyon-juniper would slow or reverse long-term, and wildfire would continue to be a threat to historic properties.

3.23.3.3.5 Direct and Indirect Effects under Alternative D (No Action Alternative)

There would be no direct effects on cultural resources from 3 Bars Project treatments as no treatments would be authorized under this alternative. The BLM would not create fire and fuel breaks; thin and remove pinyon-juniper to promote healthy, diverse stands; slow the spread of noxious weeds and other invasive non-native vegetation, especially cheatgrass; restore fire as an integral part of the ecosystem; or reduce the risk of a large-scale wildfire. Thus, long-term threat to historic resources from wildfire would be greatest under Alternative D.

3.23.3.4 Cumulative Effects

The CESA for cultural resources is approximately 1,267,997 acres and includes the 3 Bars Project area and a 5-mile buffer around the 3 Bars Project area that encompasses the viewshed of the Pony Express Trail and Eureka Palisade Stage lines that traverse the entire project area (**Figure 3-1**). Approximately 94 percent of the area is administered by the BLM, 5 percent is privately owned, and 1 percent is administered by the U.S. Forest Service. Past and present actions that have influenced land use and access in the 3 Bars ecosystem are discussed in Section 3.3.2.3.3.

3.23.3.4.1 Cumulative Effects under Alternative A (Preferred Alternative)

The BLM would treat noxious weeds and other invasive non-native vegetation under existing authorizations. New infestations would typically be found in newly burned or disturbed areas, and in areas where livestock and wild horses congregate. Treating infestations while they are small and reducing the amount of area covered by existing large infestations, would result in few effects, if any, to historic resources. There could be some risk associated with discing soil to remove cheatgrass, and possibly drill seeding, but these risks would be negligible. Surveys would be conducted prior to treatments to determine whether there are additional cultural sites in these areas which could be impacted by treatment actions. Existing and newly-found sites would be mitigated in accordance with the Programmatic Agreement before restoration work begins.

Road and utility construction, land development, and mineral, oil, gas, and geothermal leasing and development projects could affect cultural resources, but their impacts to these resources would be evaluated based on plans submitted by the developer or lessee. Cultural resources surveys completed for the Mount Hope Project documented 242 cultural sites within the mine project footprint, including 80 prehistoric and 142 historic sites, and an additional 352 sites within the larger area of potential effects, which includes a portion of the 3 Bars Project area. Implementation of the Mount Hope Project would result in adverse impacts to 83 eligible sites. Under the Programmatic Agreement developed between the mine proponent and State Historic Preservation Office, the proponent would develop, and submit to the BLM for approval, a treatment plan to address the potential direct

impacts to the 83 officially eligible sites. The proponent would implement the treatment plan prior to any surface disturbance of eligible sites within the area of direct impacts. All adverse effects under the National Historic Preservation Act and direct and indirect impacts under the NEPA to known eligible properties identified within the project area, and properties discovered during construction activities, would be mitigated in accordance with the Programmatic Agreement and the treatment plan prepared for the project (USDOI BLM 2012b:3-604). The BLM concluded that mine activities would not significantly impact cultural areas outside of the mine footprint (USDOI BLM 2012b:4-605). There would also be cumulative short-term visual effects from the Mount Hope Project, but these effects would be somewhat offset by improvement to the visual landscape from the 3 Bars Project.

Since 1985, wildfires have burned an average of about 7,000 acres annually within the CESA. Assuming a similar rate in the future, about 140,000 acres would burn from wildfires during the next 20 years. In addition to the 127,000 acres treated on the 3 Bars Project area to reduce hazardous fuels and improve ecosystem health, an additional 15,000 acres could be treated under current and reasonably foreseeable future authorizations within the CESA, totaling about 11 percent of the CESA. The BLM would conduct surveys prior to treatments to determine whether there are additional cultural sites in these areas that could be impacted by treatment actions and existing and newly-found sites would be mitigated in accordance with the Programmatic Agreement before hazardous fuel treatment work begins.

There could be adverse effects to eligible historic properties from fuels and other vegetation treatments within the CESA. Physical effects to eligible historic properties would be avoided where possible, but visual effects from treatments may not be fully avoided. Long-term, the 3 Bars Project and other restoration treatments should result in a landscape that is more fire resilient and similar to the Potential Natural Community. Noxious weeds and other invasive non-native vegetation treatments would remove vegetation that contributes to short return-interval fires and loss of native vegetation and could cause adverse effects to eligible historic sites. In addition, the BLM would conduct stream bioengineering and plantings on about 31 miles of stream to slow stream flow and create pools and wet meadows, and remove encroaching pinyon-juniper to improve wetland and riparian vegetation. These activities would help to reduce the potential for streambank erosion and potential loss of cultural materials.

3.23.3.4.2 Cumulative Effects under Alternative B (No Fire Use Alternative)

Under Alternative B, effects from non-3 Bars Project reasonably foreseeable future actions on cultural resources would be similar to those described under Alternative A. Adverse effects to cultural resources within the CESA would generally be the same as described for Alternative A. Although use of fire would not occur within the 3 Bars Project area, the use of fire could occur on several hundred acres annually in the remainder of the CESA. By not using fire to reduce hazardous fuels and improve vegetation resiliency to fire, there would be greater potential for more extensive and intense wildfires to occur in place of controlled burns on the 3 Bars Project area under this alternative as compared to Alternative A.

Because 3 Bars Project actions would affect only about 6,350 acres annually, or 1 percent of the CESA, and treatment areas would be surveyed prior to treatment to avoid or reduce impacts to cultural sites, there would be a negligible cumulative effects to cultural resources from 3 Bars Project actions. These effects would be less than under Alternative A, but greater than under Alternative C.

3.23.3.4.3 Cumulative Effects under Alternative C (Minimal Land Disturbance Alternative)

Under Alternative C, effects from non-3 Bars Project reasonably foreseeable future actions on cultural resources would be similar to those described under Alternative A. Adverse, short-term effects to cultural resources associated

with the use of fire and mechanized equipment would not occur under Alternative C. However, fire and mechanized equipment could be used on about 1,500 acres annually in other portions of the CESA and outside of 3 Bars Project areas to improve habitat, remove hazardous fuels, and reduce the risk of wildfire, and could affect cultural resources in those areas.

Because 3 Bars Project actions would affect only about 3,200 acres annually (less than 0.5 percent of the CESA), and the BLM would conduct pre-treatment surveys for cultural resources to reduce the potential for effects to eligible sites, effects to cultural resources within the CESA would be negligible.

3.23.3.4.4 Cumulative Effects under Alternative D (No Action Alternative)

Under Alternative D, effects from non-3 Bars Project reasonably foreseeable future actions on cultural resources would be similar to those described under Alternative A. There would be no cumulative effects on cultural resources from 3 Bars Project treatments as no treatments would be authorized under this alternative. The BLM could create fire and fuel breaks; thin and remove pinyon-juniper to promote healthy, diverse stands; slow the spread of noxious weeds and other invasive non-native vegetation using ground-based and aerial application methods of herbicides, especially cheatgrass; restore fire as an integral part of the ecosystem; and reduce the risk of a large-scale wildfire under current and reasonably foreseeable future authorized actions, but on a very limited acreage (about 1,500 acres annually; less than 0.1 percent of the CESA). Thus, adverse effects and benefits to cultural resources would be less under this alternative than under the action alternatives.

3.23.3.5 Unavoidable Adverse Effects

Because cultural resources are nonrenewable and their locations are for the most part unknown, project-related treatments have the potential to adversely impact historic properties, including those eligible for inclusion in the NRHP. Surveys, inventories, assessments of affect, and treatments designed to mitigate adverse effects conducted prior to project implementation would result in avoidance, which is the mitigation measure preferred by the BLM, or some other treatment (e.g., data recovery), that would reduce adverse effects. These measures, however, may only reduce cumulative effects. In addition, adoption of an unanticipated discovery plan would effectively mitigate effects either through avoidance or data recovery. While implementation of archaeological excavation as part of a data recovery plan could result in the partial or total destruction of the site, the recovered data would effectively mitigate for this destruction. Therefore, project implementation under all four alternatives would not result in unavoidable adverse effects under NEPA.

3.23.3.6 Relationship between the Local Short-term Uses and Maintenance and Enhancement of Long-term Productivity

Any destruction of cultural resources that are eligible for inclusion in the NRHP would represent long-term loss of data. In the event that avoidance of archaeological resources is not feasible, other mitigation measures may include archaeological data recovery carried out under an approved treatment and data recovery plan. Such a plan could result in the partial or total destruction of the site. However, any investigations of cultural resources made during inventories or investigations required prior to restoration treatments would enhance the knowledge of the historic-era and prehistory of the region and serve to effectively mitigate any adverse effects (USDOI BLM 2007c:4-249).

Due to the build-up of fuels, historic properties within the 3 Bars Project could be compromised either directly or indirectly by catastrophic wildfire. For example, the loss of vegetation would expose archaeological sites to an

increased risk from erosion, or direct effects could compromise the vertical and horizontal integrity of historic-era and prehistoric archaeological sites, and obsidian hydration rims for prehistoric resources, thereby limiting the ability to place prehistoric site constituents within a relative chronology. Catastrophic wildfire would also result in substantial damage or complete destruction of wooden buildings and structures that have been determined to be eligible for NRHP listing.

3.23.3.7 Irreversible and Irretrievable Commitment of Resources

Cultural resources are nonrenewable, so any impacts that may result from treatments would be irreversible, and the integrity of the affected resource would be irretrievable. Therefore, impacts to near surface archaeological sites from treatments could result in partial or complete destruction of the resource, and such loss of scientific data would be irreversible and irretrievable. Although archaeological investigations carried out under an approved treatment and data recovery plan could result in partial or complete destruction of the site, the recovered scientific data would effectively mitigate for this destruction. These investigations carried out prior to vegetation treatments would enhance and fill gaps in the body of knowledge as it relates to the history and prehistory of the region, and would serve to effectively mitigate further potential effects of activities in the area (USDOI BLM 2007c:4-249).

3.23.3.8 Significance of the Effects under the Alternatives

The significance criterion used to evaluate the impacts of the alternatives on cultural resources is whether any action would adversely affect historic properties eligible or unevaluated for inclusion in the NRHP. The Mount Hope Project could have direct and indirect impacts to 83 NRHP-eligible sites. Direct and indirect impacts to known eligible properties within the area of potential effects would be mitigated in accordance with the programmatic agreement and treatment plan developed cooperatively by the Mount Hope Project proponent, BLM, and State Historic Preservation Office. Any previously unknown eligible properties that may be discovered during construction activities would be mitigated in accordance with the Programmatic Agreement.

For 3 Bars Project treatments, most ground-based equipment would disturb only the upper few inches of soil and in most cases would be confined to previously disturbed areas such as roadways, trails, and rights-of-ways. Cultural resources on the surface should be discovered during pretreatment surveys. All treatment methods could cause indirect loss of cultural resources as a result of erosion and soil disturbance, but these effects should be minimal. Potential effects would be further reduced because the BLM has inventoried, or would conduct inventories for, cultural resources in treatment areas to lessen the chance that they would be inadvertently impacted by BLM vegetation restoration treatments. Thus, there should be a negligible cumulative loss of cultural resources on public lands due to herbicide and other vegetation treatment methods under all alternatives.

The BLM and State Historic Preservation Office have entered into a Programmatic Agreement that outlines the stipulations that will be followed to insure compliance with Section 106 of the National Historic Preservation Act for each phase of the 3 Bars Project. According to the Programmatic Agreement, all treatments shall be conducted in a manner consistent with the BLM and State Historic Preservation Office protocol. The BLM, in consultation with the State Historic Preservation Office, shall ensure that effects to historic properties are avoided through design, or redesign, or by other means in a manner consistent with the BLM and State Historic Preservation Office protocol. When avoidance is not feasible, the BLM, in consultation with the State Historic Preservation Office, Native American tribes, and interested persons, shall develop, or ensure that an appropriate treatment plan is designed to lessen or mitigate project-related effects to historic properties. For properties eligible under criteria (a) through (c) (36 CFR § 60.4), mitigation, other than data recovery, may be considered in the treatment plan (for example, Historic

American Buildings Survey/Historic American Engineering Survey recordation, oral history, historic markers, exhibits, interpretive brochures or publications, etc.). Where appropriate, treatment plans shall include provisions (content and number of copies) for a publication intended for dissemination to the general public. When data recovery is required as a condition of approval, the BLM, in consultation with the State Historic Preservation Office, shall develop, or ensure development of a data recovery plan that is consistent with the Secretary of the Interior's Standards and Guidelines for Archaeology and Historic Preservation (48 CFR § 44716-37) and *Treatment of Historic Properties: A Handbook* (Advisory Council on Historic Preservation 1980). By following the Programmatic Agreement, the BLM would ensure that there are no significant direct, indirect, or cumulative effects to cultural resources under all alternatives from 3 Bars Project actions.

3.23.4 Mitigation

Under all alternatives, the BLM shall implement the following measures in accordance with the Programmatic Agreement prepared for the 3 Bars Project.

- Consult with local Tribes in accordance with Stipulation III (A) of the *Programmatic Agreement between the Mount Lewis Field Office of the Bureau of Land Management and the Nevada State Historic Preservation Officer regarding National Historic Preservation Act Compliance for the 3Bars Ecosystem and Landscape Restoration Project, Eureka County, Nevada* (**Appendix B**).
- For each phase of the undertaking, the BLM shall evaluate cultural resources for NRHP eligibility, and consult with local Tribes or tribal members regarding areas of cultural or traditional religious importance, and consult with the State Historic Preservation Office and local Tribes regarding the NRHP determinations per Stipulation III(B) of the Programmatic Agreement.
- Develop and implement appropriate treatment measures to mitigate adverse effects to historic properties, i.e., those resources determined eligible for inclusion in the NRHP, in accordance with Stipulation III(C) of the Programmatic Agreement.
- Monitor treatment implementation according to the protocols outlined in Stipulation VII of the Programmatic Agreement, to insure that there are no inadvertent impacts to plant and wildlife of importance to traditional lifeways.
- Human remains and burial items are sacred to the local Native American tribes. Therefore, the BLM shall provide training to all BLM and contract personnel to insure compliance with the Archaeological Resource Protection Act of 1979 (16 USC § 470), as amended, and insure that the remains and associated grave goods are treated with respect and are handled according to the provisions.

3.24 Native American Traditional/Cultural Values, Practices, and Resources

3.24.1 Regulatory Framework

Federally recognized tribes have a unique legal and political relationship with the government of the United States, as defined by the U.S. Constitution, treaties, statutes, court decisions, and executive orders. These definitive authorities also serve as the basis for the federal government's obligation to acknowledge the status of federally recognized tribes.

The BLM formally consults with federally recognized tribes before making decisions or undertaking activities that will have a substantial direct effect on federally recognized tribes, or their assets, rights, services, or programs.

Laws and Orders that require agency consultation with tribes include the:

- National Environmental Protection Act
- National Historic Preservation Act as amended
- American Indian Religious Freedom Act
- Native American Graves Protection and Repatriation Act
- Archaeological Resource Protection Act
- Executive Order 13007, Indian Sacred Sites
- Executive Order 13175, Consultation and Coordination with Indian Tribal Governments
- Secretarial Order 3317, Consultation with Indian Tribes

The NEPA requires federal agencies to consult with tribes to identify a proposed action's potential to conflict with a tribe's use of the environment for cultural, religious, and economic purposes, and to work with tribes to seek alternatives that would resolve the potential conflicts.

When the National Historic Preservation Act was amended in 1992, Section 101(d)(6)(a) was added stating that "properties of traditional religious and cultural importance to an Indian tribe or Native Hawaiian organization may be determined to be eligible for inclusion in the National Register."

The American Indian Religious Freedom Act was passed in 1978 to establish a policy of federal protection for traditional Native American religious freedoms and required a review of agency programs in consultation with Native American religious leaders. Consultation efforts have been directed at identifying the concerns of Native American religious practitioners when considering agency actions. This law requires consultation with the practitioner of the native religion, not political leaders or academicians.

The Native American Graves Repatriation Act requires consultation between federal agencies and tribes to determine affiliation and disposition of the specific kinds of "cultural items" defined in the Act, which include Native American human remains, funerary objects, sacred objects, and objects of cultural patrimony. The Act also provides for inadvertent discoveries. The lead agency must also consult with any affected tribe before issuing a permit to excavate or remove remains and associated funerary objects from public land.

The Archaeological Resource Protection Act provides felony-level penalties for the unauthorized excavation, removal, damage, alteration, defacement, or the attempted unauthorized removal, damage, alteration, or defacement of any archaeological resource, more than 100 years of age, found on public lands or Native American lands. The Act also prohibits the sale, purchase, exchange, transportation, receipt, or offering of any archaeological resource obtained from public lands or Native American lands in violation of any provision, or local law.

Executive Order 13007 requires federal agencies to consult with tribes to determine whether proposed land management actions would restrict practitioners' access to and ceremonial use of Native American sacred sites on federal lands, or adversely affect the physical integrity of Native American sacred sites on federal lands. If such impacts could occur, the agency must then seek alternatives that would resolve potential conflicts.

For the 3 Bars Project the BLM and the Nevada State Historic Preservation Officer have signed a Programmatic Agreement that outlines the protocols to be completed as part of Section 106 compliance including Native American consultation, and procedures that will be used to assess both unanticipated discoveries and impacts that may occur during project implementation (**Appendix B**). Seven tribes—the Battle Mountain Band Council, Duckwater Shoshone Tribe, Elko Band Council, Ely Shoshone Tribe, South Fork Band Council, Te-Moak Tribe of Western Shoshone, and the Yomba Shoshone Tribe—are concurring parties to this agreement.

3.24.2 Affected Environment

3.24.2.1 Study Methods and Study Area

Information on Native American traditional values is based on the following ethnographic assessments produced for the 3 Bars Project and other projects within and near the project area.

- *A Report on Ethnographic Study Conducted to Assist the Bureau of Land Management in the Evaluation of Traditional Cultural Properties in the Mt. Tenabo Area*. Prepared for Cortez Gold Mines, Inc., Beowawe, Nevada, by Summit Envirosolutions, Inc, Carson City (Rucks 2000).
- *Background Ethnographic Study for Cortez Joint Venture*. Prepared for JBR Environmental, Reno Nevada (Rusco 2000).
- *Report on Ethnographic Study Conducted to Facilitate Consultation with Western Shoshone Tribal Governments of Central Nevada for the Sierra Pacific Power Falcon to Gonder 324kV Transmission Line*. Report Prepared by Summit Envirosolutions, Inc., Carson City, Nevada (Rucks 2011).
- *Northern Paiute and Western Shoshone Land Use in Northern Nevada: A Class I Ethnographic/ Ethnohistoric Overview*. Cultural Resource Series No. 12. U.S. Bureau of Land Management, Nevada State Office, Reno, Nevada (Bengston 2003).
- *Ethnographic for Pediment Project.* Report prepared by Summit Envirosolutions, Carson City, Nevada (Rucks 2003).
- *Mount Tenabo Properties of Cultural and Religious Importance Determinations of Eligibility to the National Register of Historic Places*. BLM Report No. 6-2352-1 (Dixon and McGonagle 2004).
- *An Ethnographic Study Completed for the Cortez Gold Mines Pediment Project*. Report prepared by Summit Envirosolutions, Inc., Carson City, Nevada (Rucks 2004).
- *Ethnographic Assessment for the Newe (Western Shoshone): Proposed Ruby Pipeline Project in Nevada*. Report prepared by Bengston Consulting, Inc., Sparks, Nevada (Bengston 2010).
- *3 Bars Ecosystem and Land Restoration Project: Native American Contacts Review.* Report prepared by Bengston Consulting, Inc., Sparks, Nevada (Bengston Consulting 2012).

Information presented in the following sections is based on the results of the ethnographic assessments and the ongoing government-to-government consultation process with interested tribes. BLM consultation to date includes ongoing engagement with the seven tribal entities that have expressed interest in the 3 Bars Project. These are the

Duckwater Shoshone Tribe, the South Fork Band Council, the Elko Band Council, the Te-Moak Tribe of Western Shoshone, the Battle Mountain Band Council, the Yomba Shoshone Tribe, and the Ely Shoshone Tribe. In addition, the 3 Bars Project is discussed during regularly scheduled meetings designed to inform the tribes of the project status.

The analysis area for the assessment of direct and indirect effects for Native American Traditional/Cultural Values, Practices, and Resources is the 3 Bars Project area. The analysis area for cumulative effects also includes traditional tribal rounds on or adjacent to the 3 Bars Project area, as shown on **Figure 3-1**.

3.24.2.2 Ethnography

The 3 Bars Project is situated within the traditional homeland of native peoples referred to as the Western Shoshone (*Newe*), who inhabit a region extending from Death Valley in California through the mountainous terrain of central Nevada, and into northwestern Utah and southern Idaho (Thomas et al. 1986:262–264, Sewall 1999). However, the limits of Western Shoshone territory, like those of many early Native American groups, tended to be somewhat variable over time (Kroeber 1925, Driver 1937, Malouf 1950 [1940], Steward 1970 [1938], and Grosscup 1977 *cited in* Thomas et al. 1986:262).

3.24.2.2.1 Social and Political Organization

According to Steward, the Western Shoshone social structure and practices could best be characterized as "quantitative simplicity" in that the Western Shoshone lacked many of the cultural institutions often typical of the majority of Native American groups. These included an absence of significant and clearly defined linguistic differences between them and neighboring groups, a lack of gender- or age-based societies, or political organization beyond the local village level. Although inferring a certain degree of environmental determinism, Steward posited that the Western Shoshone social system was "…the inevitable response to areas of meager resources, low population density, and an annual cycle of nomadism" (Steward 1970 [1938]:115).

Relatively little appears to be known regarding ethnographic-period groups residing specifically within the 3 Bars Project area. Rucks (2004:3) suggested that this general paucity of information may have resulted because Julian Steward (one of the primary sources of early ethnographic data on the Western Shoshone) avoided some portions of the project area and vicinity because of heavy historic-era mining. One exception consists of the *Pasiatekkaa*. Steward stated that their home district—the Diamond, Pine Creek, and Little Smoky Valleys—was not particularly fertile except at the base of Roberts Mountains and Sulphur Spring Range where various seeds, root vegetables, and especially pinyon nuts were harvested (Steward 1970 [1938]:141–144). Steward documented village sites or groups of encampments, including *Bauwiyoi*, *Tupagandö*, and *To:dzanadö* that were at the base of the mountains, where water was more abundant than on the valley floors. Steward (1970 [1938]:142) noted that most of the information gathered regarding subsistence activities and the social and political structure was derived from the inhabitants of *To:dzanadö*; however, it can be inferred that they were applicable to the other village groups situated at Pine Creek north of Roberts Mountains and in the Diamond Valley.

3.24.2.2.2 Kinship and Marriage

For the Western Shoshone, kinship terms and status reflect a fundamental division of labor, with men mostly hunting and women almost exclusively gathering floral foodstuffs or smaller animals. Consequently, marriage was a critical economic institution just as much as it was an emotional or spiritual one. In this system, particularly successful hunters could take more than one wife, although the oldest sisters were typically married off first. Bride prices or

dowries, although common among many Western Shoshone groups, were quite uncommon or unknown altogether among those peoples residing east of the Humboldt River and west of the Reese River Valley. Marriages typically resulted in strong family bonds; the highest level of Western Shoshone social and political structure was the immediate family or small family groups, and armed conflict was a rare occurrence (Steward 1941:311, Cappannari 1960 *cited in* Thomas et al. 1986:277).

Although Western Shoshone marriage practices (an important mechanism for regional and intergroup contact and interactions) have been well documented for many regions within their traditional territory, the Kobeh and Diamond Valleys within and adjacent to the 3 Bars Project area have not been subjected to the kind of intensive ethnographic observations and research characteristic of other regions. Regardless, marriage customs (and other social practices) in the project area were likely similar to those in better-studied areas such as the Reese River, Big Smoky, Spring, Snake, and Little Smoky Valleys, where most marriages were contracted with a "frequency relative to the distance separating groups" (Steward 1970 [1938]). Population density also appears to have played a role in very specific marriage and group interaction practices during the ethnographic period. Although marriages between related kin were prohibited among the Western Shoshone, marriage between cross cousins and "pseudo cross cousins" (mother's brother's stepchildren or father's sister's stepchildren) was practiced in the nearby Big Smoky and Little Smoky Valley regions (Steward 1970 [1938]). Marriage between cross cousins (a closer familiar relationship) was practiced in the Steptoe, Ruby Valley, and Elko regions (Delacorte et al. 1992:24). Eggan (1980 *cited in* Delacorte et al. 1992:24) noted that cross cousin marriage increased bonds within groups while reducing ties with outside populations. Eggan posits this was a consequence of the ecologically rich setting of places like the Ruby Valley, where there was little need to go outside the local group for marriage purposes, thereby strengthening local bonds and deemphasizing ties with distant groups.

3.24.2.2.3 Group Social Interaction

In the most arid regions of Western Shoshone territory with the least prolific and predictable resources, social groups were residentially mobile and the kinship system functioned more as a social network and communication system than as an economic foundation. However, with subsistence being potentially tenuous in such areas as Death Valley, this networking served the critical function of a communication system broadcasting the locations and value of resource patches in a marginal environment. Conversely, Eggan (1980:177 *cited in* Thomas et al. 1986:278) noted that the unpredictability of resources, particularly in arid regions, resulted in the development of pronounced intergroup sharing restrictions, with women essentially "owning" critical seed harvests. This was especially manifest in winter camps, where the women were responsible for the general welfare of the immediate family but there was no obligation to share often scarce resources with the larger group.

In the more ecologically diverse and resource-rich landscapes of the Western Shoshone territory, social practices tended to differ from those expressed in areas such as Death Valley, Panamint, or Little Smoky Valley situated just southeast of the project area. In the well-watered settings such as those found in the Reese River, Spring, Snake, Antelope, and Ruby Valleys, vast stands of pinyon pine, dense patches of seed-bearing grasses and other plants, and plentiful large game promoted greater social and residential stability and higher population densities than in the more arid regions. In these resource-rich areas, there was less need for the social systems employed in marginal settings to provide networks for monitoring ecological conditions and sharing information about the location and quality of resources (Thomas et al. 1986:279). Groups inhabiting these areas developed social systems designed to increase local group integrity, with a marriage alliance system increasing broader community bonds. In effect, as dense and varied resources allowed for more residential stability, the social system correspondingly shifted away from the

immediate family level and toward structures that encouraged and increased the more generalized and widespread group integration.

3.24.2.2.4 Subsistence and Resource Management

Research conducted by Steward (1941, 1943, 1970 [1938]), Fowler (1977, 1982 *cited in* Fowler 1986), and Thomas (1981b, 1983a) forms the core of what is presently known regarding the Western Shoshone subsistence economy. A great deal of variation in this economic structure existed within the Western Shoshone territory during ethnographic times; however, common resources, procurement methods, and preparation techniques link the widespread Western Shoshone groups.

The labor often invested in sustaining specific floral and faunal resources clearly indicates that certain areas were subject to repeated visits over long periods of time. Rights to those maintained resources essentially resulted in a claim of control, although not necessarily "ownership" in the present-day sense of the word. Rucks' (2004) informants agreed that these rights to particular gathering areas and campsites were recognized by outside groups based on evidence of management and consistent use.

As with their exploitation of many important foodstuffs on their lands, the Western Shoshone attached a certain degree of spirituality to their procurement. The harvesting of pinyon nuts, once the most prominent staple among the Western Shoshone and many other tribes in the region, was not only an important subsistence activity but an important cultural event, and to some extent is still today. Harvests were provided with a spiritual leader who arranged and presided over a pinyon nut harvest dance before gathering. This several-day celebration constituted a major social event and included prayers, songs, dances, gaming and sporting events, and feasting. New group leaders were chosen, marriages were arranged, and people exchanged information about resources, harvesting techniques, and political affairs. Plans for subsequent harvests and social alliances were developed. The largest celebrations and harvests in the project area occurred on the Roberts Mountains and Sulphur Spring Range with smaller events in the Mount Tenabo area (Rucks 2004:12). To a great extent, the size of these celebrations was the result of an increased population in these areas, supported by the diverse and dense resources present in them. For example, according to Rucks (2004:6), the present-day Western Shoshone still refer to Roberts Mountains as a resource-rich area (especially pinyon) that Steward (1970 [1938]:141) noted as being capable of supporting up to 60 households, a far larger population than in many surrounding parts of Western Shoshone territory.

The BLM has met with the Western Shoshone on several occasions during the past 3 years to better understand their concerns. The results of these meetings are summarized in the *3 Bars Ecosystem and Land Restoration Project: Native American Contacts Review* (Bengston Consulting 2012). Based on these discussions, several plant and animal species of importance to local tribes were identified. Specific plants and their ethnographic use are:

- Basin wildrye – food source
- Bunchgrass (Indian ricegrass) – food source
- Camas (Yomba) – food source
- Large sage – purifying, medicinal tea, and the manufacture of wooden implements and textiles
- Mint – food source
- Mormon (Indian) tea – medicinal tea
- Mountain mahogany – medicinal, wooden implements, and fuel
- Pinyon pine – food source
- Utah juniper - medicinal

- Watercress – food source
- Wild onion – food source
- Willow – basket weaving

In addition, the tribes use fish, sage-grouse, jackrabbit, pygmy rabbit, pronghorn antelope, mule deer, and other wildlife for food.

3.24.2.2.5 Ethnobotanical and Ethnoecological Perspective

Cutting live trees for firewood is frowned upon by many present-day Western Shoshone and only dead wood is cut, a practice that does not harm trees or reduce potential future nut harvests. Although pinyon nuts no longer constitute a major staple food for the Western Shoshone, they are consumed on special occasions, such as when a tribal member enlisted in the U.S. armed forces is going overseas or off to war (George 2000:38).

George (2000:39) also noted that her Western Shoshone (Duckwater Reservation) consultants universally expressed disapproval of commercial pinyon nut pickers. To many Western Shoshone maintaining traditional cultural norms, commercial pickers are seen as greedy intruders who strip trees bare of their cones and take an important traditional food source away from their people with no consideration of the ecological or cultural implications of their actions. Comparable situations have developed in Western Shoshone territory where, for strictly commercial purposes, non-native harvesting has nearly eliminated bear grass, an important traditional basketry material.

As part of the Mount Hope ethnographic assessment (Bengston 2007), three culturally significant areas within the 3 Bars project area were identified. These are Kobeh Valley, Roberts Mountains, and the Sulphur Spring Range. Tribal representatives indicated that the northern side of Mount Hope was a favored pine nut gathering area (Bengston Consulting 2012:23). During the current study, tribal representatives stated that Roberts Mountains was and still is used for hunting and plant gathering, and that there are *Newe* who went into the mountains to offer prayers. A tribal elder from Duck Valley mentioned that two types of minerals, *abe* (a white chalk used in ceremonies) and a red mineral, are still collected in the Roberts Mountains, but did not state the specific location.

3.24.2.2.6 Hunting

Important faunal species taken by the Western Shoshone included bighorn sheep and pronghorn antelope. Bighorn sheep were hunted during both the winter season and also during the warmer months, when their diurnal movements could be easily tracked, and were sometimes procured through the use of permanent hunting blinds or with dogs assisting in their pursuit (Muir 1894:322, Lowie 1924:195, Steward 1941:220–221 *cited in* Thomas et al. 1986:267). During the winter months, bighorn sheep hunting shifted to higher elevations, with hunters hiding behind previously constructed rock walls, cairns, and blinds. These were particularly common alongside canyons that served to guide the sheep into restricted areas where the kill would be easier. Generally, bighorn sheep procurement among the Western Shoshone was an individual pursuit, with a single hunter typically taking one sheep at a time. However, Steward (1970 [1938]:148) documented communal sheep hunts in the Ruby Valley that were the only ones of their kind among the Western Shoshone.

Pronghorn antelope, although hunted individually as well, were typically procured through the use of large communal drives. Steward (1970 [1938]) and Bengston (2003:Figure 2.5) noted that antelope drives occurred in the Diamond Valley just north of Eureka and in the general vicinity of two winter villages, one at the eastern edge of the Sulphur

Spring Range and another just south of present-day Eureka (Egan 1917:240 *cited in* Thomas et al. 1986:267, Steward 1970 [1938]:33).

Rabbits, another important species procured for their meat and skins, were also hunted primarily through the use of communal drives. Just like the antelope hunts, fall rabbit hunts, conducted following the pinyon harvest and in conjunction with the fall festival (Steward 1970 [1938]:105), were significant social occasions, attracting families from a broad geographic area. Rabbit drives certainly occurred with some regularity throughout the project area, although Steward (1970 [1938]) and Bengston (2003:Figure 2.3) noted one such site in the southern Diamond Valley just north of the town of Eureka. As with the pronghorn antelope hunts, rabbit drives were also accompanied by those with recognized shamanistic abilities. In addition to bighorn sheep, pronghorn antelope, and rabbits, a wide variety of other animal species were also hunted, trapped, or otherwise captured for food, fur, feathers, or other materials.

3.24.2.2.7 Spirituality and World View

According to Miller (1983), three basic principles constitute the foundation of the Western Shoshone world view and are largely common to indigenous cultures throughout the world. The first and foremost, referred to by the Western Shoshone (and their Northern Paiute neighbors) as the *puha*, perceives an all-compassing and ever-present life force or consciousness that animates virtually everything in the universe—rocks, plants, animals, water, people—and is characterized by Miller (1983:73 *cited in* Rucks 2004:22) as "…life-force energy…not static or concrete, but rather kinetic, always moving and flowing through the cosmos, underpinning all facets of the universe…" The second principle is that of the intimate relationship between people and land in which they reside. The third, like the second, is derived from the *puha*, and relates to the personalized nature of spiritual experience and its integration into everyday life.

Western Shoshone spiritual tradition holds that *puha* permeates the world and has been in existence since the "myth-age" when animals were people before the Shoshone became human (Deaver 1993 *cited in* Rucks 2004:24, Rucks 2004:22). Western Shoshone creation myths state that in the beginning the earth was covered with water, but during the "drying time" when the floodwaters receded, the first people moved down-slope from Mount Tenabo to live near the numerous springs found at lower elevations. They were told by the Creator "Anything that comes into the world after the drying up of the water will be your relative" (Tom Austin as told to Lowie [1924] *cited in* Rucks 2004:24). This particularly illustrates the second foundational principle of the Western Shoshone world view—that of the intimate relationship between the Western Shoshone people and their land.

According to Miller (1983:337 *cited in* Rucks 2004:22), although *puha* is universally present, it is concentrated in certain landscape features and natural objects, moving in "web-like currents linked to mountain peaks and water sources." Such places are known to and accessed by traditional medical practitioners who engage the power through various means for healing and encouraging various natural phenomena.

3.24.2.3 Documented Ethnographic Sites and Traditional Cultural Properties

Seven ethnohistoric resources dating to the protohistoric/ethnographic period have been identified thus far within the project area. The first ethnohistoric site consists of unevaluated stocked logs that could be the remains of a Shoshone structure located in Sheep Corral Canyon, near the western boundary of the project area. The remaining six sites have been recommended eligible for inclusion in the NHRP, and consist of another possible structure located slightly north of Sheep Corral Canyon, two resources in the vicinity of Indian Ranch that appear to be a temporary Shoshone

woodcutters' camps, another camp that may have been associated with ranching, a camp possibly associated with charcoal manufacturing, and two camps associated with springs on the north flank of Roberts Mountains.

Although no Traditional Cultural Properties are situated directly within the project area, the Mount Tenabo Traditional Cultural Property is immediately adjacent to the northwestern corner of the project boundary.

3.24.2.4 Native American Consultation

The BLM continues to engage the seven tribal entities that have expressed interest in the 3 Bars Project. The 3 Bars Project is discussed during regularly scheduled project status meetings with the tribes, and the tribal entities were consulting parties during the preparation of a *Programmatic Agreement between the Mount Lewis Field Office of the Bureau of Land Management and the Nevada State Historic Preservation Officer regarding National Historic Preservation Act Compliance for the 3 Bars Ecosystem and Landscape Restoration Project, Eureka County, Nevada* for the 3 Bars Project (**Appendix B**).

3.24.3 Environmental Consequences

3.24.3.1 Key Issues of Concern Considered during Evaluation of the Environmental Consequences

Key issues of concern pertaining to Native American traditional/cultural values, practices, and resources were identified in the AECC and during scoping. These are:

- Decline in distribution and abundance of traditional, edible, and medicinal plants.
- Decreased pine nut production and tree vigor.
- Decline in wild game species.

3.24.3.2 Significance Criteria

The American Indian Religious Freedom Act, as amended, and Executive Order 13007 (Sections 3.6.1.1 and 3.6.1.2) apply to sites used for religious ceremonies and/or documented sacred sites. These statutes do not specify criteria for determining whether a project would affect such places, however for the purposes of analysis in this EIS, sites used for religious ceremonies as referred to in the American Indian Religious Freedom Act and sacred sites referred to in Executive Order 13007, a project effect is considered significant if it restricts access to such sites, in some way impedes the exercise of ceremonies at such sites, or affects the physical integrity of such sites. In addition, effects on Traditional Cultural Properties that are eligible for listing in the NRHP because of their traditional religious or cultural values would be assessed for impacts under 36 CFR § 800.9 of Section 106 of the National Historic Preservation Act.

Implementation of vegetation management practices may result in impacts to traditional plant resources or ceremonial sites. For example, the treatment could result negative health effects or destruction to traditional edible or ceremonial plants and prescribed or wildland fire may destroy traditional edible plants and/or basket weaving materials. A site would be considered susceptible to a significant effect under one (or more) of the following project-related situations:

- Access is reduced or lost (Executive Order 13007).
- Physical destruction or disturbance (Executive Order 13007 and National Historic Preservation Act).

- Alteration of setting (American Indian Religious Freedom Act and National Historic Preservation Act).
- Introduction of visual, noise, or atmospheric elements that are out of character with the religious ceremonies or that compromise the sacred values (American Indian Religious Freedom Act, Executive Order 13007, and National Historic Preservation Act).

3.24.3.3 Direct and Indirect Effects

3.24.3.3.1 Direct and Indirect Effects Common to All Action Alternatives

Historically, there have been direct conflicts between vegetation treatments and resources that are of importance in maintaining Native people's lifeways and/or spiritual values. The following discussion of the various vegetation treatment options and effects on resources that may be of importance in maintaining Native people's lifeways is adapted from the 17-States PER (USDOI BLM 2007c). This section also includes effects unique to the 3 Bars project that have been identified through scoping, consultation between the BLM and the seven tribes, and ethnographic studies conducted by Bengston Consulting for this project and others listed above in Section 3.24.2.1. In addition, the reader is encouraged to read the Native and Non-invasive Vegetation Resources (Section 3.12), Fish and other Aquatic Resources (Section 3.15), Wildlife Resources (Section 3.16), and Human Health (Section 3.26) sections of this EIS for more information on resources and issues of interest to local tribes.

Adverse Effects

Treatment activities that remove vegetation or alter the distribution, health, and welfare of plants and animals used by Native peoples would have the greatest potential to harm natural resources with associated traditional values. During treatments, the BLM would have limited ability to avoid plants identified by Native peoples as being important in traditional subsistence, religious, or other cultural practices.

Beneficial Effects

Treatments to enhance riparian vegetation and increase the number of miles of BLM-administered streams that are classified as "Proper Functioning" would provide good habitat for fish that are harvested by Native peoples. Improvements in habitat quality would increase the carrying capacity of the landscape and allow it to support larger and healthier wildlife populations. In particular, treatments would benefit mule deer, pronghorn antelope, and Greater sage-grouse by removing vegetation (pinyon-juniper) that is degrading habitat or thinning vegetation (pinyon-juniper and sagebrush) to allow more desirable vegetation, such as forbs and grasses, to better compete and thrive. Thinning and removing vegetation would also benefit local and seasonal movement of wildlife, including mule deer and Greater sage-grouse. Because water is scarce on the 3 Bars Project area, the BLM would implement stream and riparian restoration projects to improve water availability for fish and wildlife.

Treatments that remove hazardous fuels from public lands would be expected to benefit the health of plant and animal communities in which natural fire cycles have been altered, and to improve accessibility for tribal cultural practices. Treatments that control populations of non-native species on public lands would be expected to aid in the reestablishment of native plant species. Treatments to control non-native species would benefit game species and plants used for traditional/cultural values and practices, including species associated with shrubland habitats (e.g., Greater sage-grouse, sharp-tailed grouse, quail), where most treatments would occur (USDOI BLM 2007c:4-109).

3.24.3.3.2 Direct and Indirect Effects under Alternative A (Preferred Alternative)

Riparian Treatments

Adverse Effects

Mechanical methods consisting of a track-hoe, backhoe, and dump trucks have the potential to affect a broad range of plant resources, some of which may be of importance to Native peoples. There could be short-term loss of fish habitat and fish resources during stream reconstruction. As opposed to mechanical methods, manual treatment is highly selective and would have less of an effect on plants with traditional/cultural practices and values such as willow, basin wildrye, mint, watercress, wild onions, and bunchgrass that can be found in riparian zones.

Riparian treatments are proposed to occur in areas identified as harvest units for Christmas trees, greenwood, and pine nuts. Within riparian treatment areas, only pinyon-juniper removal would be expected to affect woodland products. Pinyon-juniper removal would occur over a very small portion of designated harvest areas for Christmas trees, pine nuts, and greenwood. These treatments would affect a small percentage of the total woodland products harvest acreage within the 3 Bars Project area, and would not constitute a measurable reduction in special woodland products available for harvest.

The use of small, temporary exclosure fencing to protect treatment sites could limit Native American access to fish and wildlife harvest areas.

Beneficial Effects

Treatment activities would include streambank bioengineering, grade stabilization, and vegetation plantings to initiate stream restoration on up to 31 miles of stream. The habitat improvements would be beneficial to macroinvertebrates, which represent an important food source for fish species, and to Lahontan cutthroat trout (occupied and recovery streams) and game fish species used by local tribes. Habitat improvements in the Lahontan cutthroat trout recovery streams may assist in the reintroduction of this species into habitats that were used historically.

Riparian treatments would enhance water quality and quantity for wildlife used by the tribes, while also promoting improved habitat conditions that would lead to higher quality forage and cover. Approximately 85 percent of riparian treatment acreage is within mule deer summer or winter range habitat, while over 80 percent of the riparian treatment acreage is within the summer or winter range for Greater sage-grouse. Proposed treatments would help to restore degraded riparian habitat, including about 1,250 acres of mule deer habitat, 177 acres of pronghorn antelope habitat, and 1,300 acres of Greater sage-grouse habitat that are degraded due to pinyon-juniper encroachment.

Encroachment of non-native plant species, and displacement of native plant species that serve as important sources of food, reduces the suitability of the habitat for these wildlife species (USDOI BLM 2007b:4-119). Removal of noxious weeds and other invasive non-native vegetation would also promote streambank stability and allow native species to recolonize degraded areas and provide fish and wildlife habitat.

Vegetation treatments that reduce hazardous fuels and create fire breaks would benefit Native American resources by reducing the chances that a large, uncontrolled wildfire would destroy a large amount of high quality vegetation and fish and wildlife and their habitats. The restoration of natural fire regimes and native ecosystems would have long-term benefits associated with increasing the presence and abundance of native plant, fish and wildlife resources important to maintaining Native American traditional lifeways.

Aspen Treatments

Plant species of interest to Native Americans within aspen management units would be similar to those found within riparian treatment zones. Adverse and beneficial effects would be the same as Effects Common to All Alternatives and for Riparian Treatments. The initial acreage of aspen identified for treatment is low (151 acres over 10 years). Therefore, potential loss of Native American traditional resources initially would be localized to very small areas in the Roberts Mountain, JD, 3 Bars, and Santa Fe allotments. In later years, a similar acreage could be treated in the Simpson Park East and Northeast areas.

Pinyon-juniper Treatments

With the exception of Sulphur Spring Wildfire Management Unit, Whistler, Lone Mountain, and Tonkin North and South units, all of the proposed treatment units are within the Roberts Mountains. As stated in the Riparian Treatments section, ethnographic documentation indicates that the Roberts Mountains have been identified by Native American consultants as an important hunting and plant gathering area, particularly for pinyon pine nuts. Pinyon nuts played a significant role in the subsistence, resource management, seasonal migration patterns, spiritual practices, and world view of the Western Shoshone. Other ethnographic plant species identified by Bengston Consulting (2012) that may be found within pinyon-juniper woodlands consist of large sagebrush, basin wild rye, Indian ricegrass, and possibly Mormon tea and wild onions. Historically, the base of the Roberts Mountains was important for the Western Shoshone because of the abundance of root vegetables and seeds, especially pinyon pine, that were harvested there. These resources were also abundant at the base of the Sulphur Spring Range, where the BLM proposes to use wildland fire for resource benefit to manage pinyon-juniper. These environments also provide habitat for various species of wildlife that are important to Native Americans, including pygmy rabbit and Greater sage-grouse.

Adverse Effects

Because of ground disturbance associated with the use of mechanical treatments and the effects associated with prescribed and wildland fire for resource benefit, the potential inadvertent and short-term adverse effects to traditional plant and fish and wildlife resources would be similar to the Effects Common to All Alternatives and Riparian Treatments.

Dense stands of pinyon-juniper provide habitat for mule deer during severe winter weather because of the reduced snow cover and increased thermal cover in these areas. Removal of pinyon-juniper in Phase II and III stands could mean a loss of this wildlife benefit. Pinyon-juniper woodlands also provide habitat structure that would be lost if woodlands were converted to grasslands (Maser and Gashwiler 1978).

Treatments would reduce fuel loads, and fuel breaks to be constructed around old-growth pinyon-juniper woodlands would reduce the risk from catastrophic wildfire. For example, treatment areas on the west slope of the Roberts Mountains have not experienced a large-scale wildfire in over 100 years. As a result, these units have a high to very high or very high to extreme risk for a catastrophic wildfire.

The BLM does not plan to conduct burns in Phase I stands, but would conduct stand-replacement burns that could cover several thousand acres annually in Phase II and III pinyon-juniper stands. About 60 percent of treatments would occur in Phase II and III stands. Prescribed fires would open up pinyon-juniper stands and stimulate the growth of native forbs and grasses to benefit wildlife, but there could also be a minor loss of Wyoming big sagebrush and of other shrubs desirable for Greater sage-grouse, pronghorn antelope, and mule deer hunted by Native Americans. It is likely that large, older pinyon-juniper trees that provide juniper berries and pinyon nuts for mule deer and other

wildlife would also be lost. Fire may top-kill some plants used by Native Americans, including Basin wild rye, camas, Indian ricegrass, and Mormon tea, but fire has been shown to enhance their long-term health and development (Howard 1993, Tirmenstein 1999, Anderson 2002, 2004).

Concerns have been expressed by local tribes regarding traditional pine nut harvesting in general and the removal of pinyon pine. Some seed bearing trees would be destroyed or removed by mechanical or hand treatments and fire, and prescribed and wildland fires would require the construction of fuel breaks, which could also compromise plant species of importance to Native American lifeways. Treatments would affect approximately 26 percent of the total designated woodland products harvest area, including 28 percent of the pine nut harvest area. Removal of pinyon pines and juniper from these areas would eliminate or limit the ability to harvest woodland products there, although a large portion of the project area would not be affected. Additionally, other nearby areas in the Battle Mountain District, which make up a substantial portion of the annual harvest area, would not be affected by treatments under the 3 Bars Project.

Beneficial Effects

A key project goal is to increase the distribution and abundance of traditional, edible, and medicinal plants by improving the relative abundance of desirable plant species in previously identified locations (obtained through Native American consultation). This would include sustaining the regeneration and recruitment of desirable species such as aspen, bitterbrush, and curl-leaf mountain mahogany. Although the majority of pinyon-juniper management is focused on hazardous fuels reduction, treatments associated with the Atlas Unit group would involve removal of pinyon-juniper to encourage shrub and riparian species growth. Plants used by local tribes that could benefit from these treatments include basin wildrye, Indian ricegrass, Mormon tea, and sagebrush.

Manual, mechanical, and fire treatments in pinyon-juniper management areas would improve aquatic habitat by increasing stream flows and using downed logs and other wood in streams to create pools and other fish habitat. These treatments would benefit Lahontan cutthroat trout and game fish habitat in Birch, Pete Hanson, and Willow Creeks.

Treatments would help to improve big game habitat, especially in areas with degraded habitat. All of the pinyon-juniper treatment sites are within mule deer summer or winter range, 60 percent of sites are within pronghorn summer or winter range, while nearly 95 percent of the treatment area is within the summer or winter range for Greater sage-grouse. Over 70 percent of acres targeted for treatment occur where the BLM has determined that mule deer or Greater sage-grouse habitat is declining, and nearly 60 percent of the treated acreage would be in areas where pronghorn antelope habitat is declining.

Treatments in the Atlas, Frazier, Gable, Henderson, Upper Roberts, and Vinini units would primarily benefit Greater sage-grouse, but would also open up pathways in drainages, and provide forage for other wildlife by promoting development of native grasses, forbs, and shrubs through removal of pinyon-juniper. These areas also provide important year-round habitat for pronghorn antelope and crucial summer range for mule deer.

Pinyon-juniper encroachment has adversely impacted pygmy rabbit populations (Grayson 2006). Although pygmy rabbits will use areas with limited pinyon-juniper cover, stands with 40 percent or greater cover provide only marginal habitat for pygmy rabbits (USDOI BLM 2003c). The Atlas and Henderson units provide habitat for pygmy rabbits. Pygmy rabbits forage primarily on sagebrush, so treatments that remove pinyon-juniper and stimulate the growth of shrubs and herbaceous vegetation would benefit pygmy rabbits in the long-term.

A large amount of downed logs and woody debris would result from pinyon-juniper management and could be used for firewood. By thinning and removing pinyon-juniper, competition among remaining trees for water and other resources would decline, and the remaining pinyon pines should be able to produce more nuts.

Although there is the low potential for short-term adverse effects to traditional use resources and Native American health, the restoration of natural fire regimes and native ecosystems would have long-term benefits to the presence and abundance of native plant, fish, and wildlife resources important to maintaining traditional lifeways.

Sagebrush Treatments

Adverse Effects

Because of ground disturbance associated with the use of manual and mechanical treatments, the potential inadvertent and short-term adverse effects to traditional plant and terrestrial resources would be similar to the Effects Common to All Alternatives and Pinyon-juniper Treatments. The BLM would use manual and mechanical treatments to seed and plant sagebrush and perennial grasses within sagebrush communities, and control noxious weeds and other invasive non-native vegetation. Kobeh Valley was identified by Bengston (2007) as a culturally significant area within the 3 Bars Project area.

Prescribed fire could be used to remove cheatgrass and other non-native vegetation on the West Simpson Park Unit. As it is unlikely that plants favored by local tribes would be found in areas dominated by non-native vegetation, the effects of prescribed fire on traditional plant and terrestrial resources should be negligible.

Only 1.3 miles of perennial stream habitat are associated exclusively with sagebrush management projects—Rocky Hills (Coils Creek), Table Mountain (Henderson and Vinini Creeks), and West Simpson Park (unnamed streams) units. Lahontan cutthroat trout occurs in Henderson and Vinini Creeks, while native fish (speckled dace) have been reported in Coils Creek. Manual and mechanical treatments could result in increased water runoff and erosion, and spills of fuels and lubricants, to the possible detriment of water quality and aquatic habitat.

Beneficial Effects

Treatments should lead to improved and increased sagebrush habitat and sagebrush resiliency to fire, and open up the sagebrush canopy to slow wildfire spread and promote the development of an herbaceous understory including those plant species mentioned above and of importance to Native American traditional lifeways. In intact sagebrush communities, only 20 percent of the area would be treated and the BLM would create a mosaic of sagebrush and herbaceous vegetation that would retard the spread of wildfire and provide habitat for Greater sage-grouse, another traditionally important species identified in consultation with the Native American community (Bengston Consulting 2012). While there is the potential for short-term adverse effects, the long-term benefits associated with the planting of native perennial vegetation and improved Greater sage-grouse habitat would result in substantial long-term benefits by restoring native sagebrush habitat.

The beneficial effects of sagebrush treatments would include improvements in aquatic and riparian habitats and a reduction in wildfire risk. Trees that are removed as part of this treatment could be placed in streams to expand the stream width and help create or expand pool habitats. The woody structures also would provide additional instream cover for game fish and organic material to the stream environment.

The primary focus of 3 Bars Project sagebrush treatments is to improve habitat for nesting Greater sage-grouse. Approximately 98 percent of proposed treatment acres are within pronghorn antelope summer or winter range, 65 percent are within summer or winter range for Greater sage-grouse, and 55 percent are within mule deer summer or winter range. Loss and degradation of sagebrush habitat has occurred on the 3 Bars Project area, and proposed treatments would focus on restoring sagebrush habitat. Over 85 percent of the acres treated would occur where the BLM has determined that pronghorn antelope habitat is declining, nearly 65 percent of acres treated would occur where Greater sage-grouse habitat is declining, and 45 percent of the acres treated would occur where mule deer habitat is declining. These include treatments on the Rocky Hills and West Simpson Park units, where the BLM would control non-native vegetation to encourage sagebrush development in areas with active or historic Greater sage-grouse leks.

Pinyon-juniper encroachment has impacted pygmy rabbit populations (Grayson 2006), especially where pinyon-juniper cover exceeds 40 percent. Pinyon-juniper removal projects at the Three Corners and Whistler Sage units could benefit pygmy rabbits, although treatments would occur in Phase I stands, where pinyon-juniper cover is less than 40 percent.

3.24.3.3.3 Direct and Indirect Effects under Alternative B (No Fire Use Alternative)

The types and magnitude of effects for manual, mechanical, and biological control treatments would be similar between Alternatives A and B. Because the BLM would not be able to use fire, however, there would be none of the adverse or beneficial impacts associated with this treatment method. In particular, there would be no harm to or loss of native vegetation or fish and wildlife habitat from prescribed fire and wildland fire for resource benefit. There would also be no risk of a prescribed fire spreading beyond treatment boundaries and impacting native plants and fauna of interest to the Native American community, which could be the case under Alternative A. The few native plants and wildlife that are found in dense stands of pinyon-juniper may not experience habitat loss under this alternative.

Acres and types of wetland and riparian habitat and miles of stream restored would be similar to Alternative A. However, less effort would be spent by the BLM on slowing pinyon-juniper encroachment into sagebrush and riparian communities, removing Phase II and III pinyon-juniper, restoring historic sagebrush habitat, and controlling noxious weeds and other invasive non-native vegetation that is adversely impacting native vegetation and fish and wildlife habitat.

Under Alternative B, the BLM would be limited to manual and mechanical methods for removing noxious weeds and other invasive non-native vegetation and replanting and reseeding to promote the growth of native forbs and grasses. However, the West Simpson Park Unit is on rugged terrain, and use of mechanical equipment to control cheatgrass would be difficult on this unit.

The inability to use prescribed fire and wildland fire for resource benefit would probably have few short-term effects. By not using fire, risks to non-target vegetation, including plants used by local tribes, from treatments would be negligible. Long-term, however, native vegetation and fish and game species would experience fewer of the benefits associated both with creating openings in dense pinyon-juniper habitat and creating a mosaic of pinyon-juniper and sagebrush habitat.

Under Alternative B, riparian restoration treatments would primarily be limited to manual treatments (placing logs and rocks in streams to slow water flows, using small, temporary exclosure fencing to exclude livestock, wild horses,

and other wild ungulates, and stimulating aspen regeneration) that would help to create wet meadows and enhance riparian vegetation and fish and wildlife habitat. Because fire would not be available to reduce hazardous fuel loads, Alternative B may pose a greater long-term risk for wildfire due to the accumulation of fuels. Without the use of prescribed fire and wildland fire for resource benefit, the BLM would be unable to restore fire as an integral part of the ecosystem. It is unlikely that the trend toward large-sized fires of moderate to high severity in sagebrush and large stand-replacing fires in pinyon-juniper would slow or reverse in the long-term, and catastrophic wildfire would continue to be a threat to traditional pine nut gathering locations, and plants such as basin wild rye and Indian ricegrass that are found in sagebrush and pinyon-juniper habitats.

Under Alternative B, Native American traditional/cultural values, practices, and resources would benefit from treatments, but not to the extent that would occur under Alternative A.

3.24.3.3.4 Direct and Indirect Effects under Alternative C (Minimal Land Disturbance Alternative)

The types and magnitude of effects for manual treatments on Native American resources would be similar to those for the other alternatives. The BLM has not identified areas where it would use classical biological control, but if nematodes, insects, or fungi are used on the 3 Bars Project area, treatments would generally be small in size and effects would be localized, or if used on cheatgrass, could cover large areas of habitat that support little native vegetation or wildlife. Thus, the effects on Native American resources from classical biological control would be minor and primarily restricted to those species using vegetation treated by these methods.

Most of the treatments under this alternative would be to thin and remove pinyon-juniper using chainsaws where it is encroaching into riparian, aspen, and sagebrush habitats. There would be fewer direct impacts to plants and animals used by Native Americans from treatments under this alternative than the other alternatives, because adverse impacts, such as harm to or death of plants and wildlife, and noise and other disturbance, would be much less with manual methods than with the other methods. Since fewer acres would be treated, however, there would be fewer benefits to Native American resources under this alternative than under Alternatives A and B. Manual treatments would be small in scale and mostly targeted to pinyon-juniper stands. By not being able to use mechanical equipment, the BLM would have limited capabilities to benefit Native American resources by:

- Conducting stream bioengineering and restoration, except on a limited basis on only a few stream miles, to benefit Lahontan cutthroat trout, other game fish, Greater sage-grouse, and native riparian vegetation.
- Controlling noxious weeds and other invasive non-native vegetation, except on very small areas where this vegetation can be hand pulled or controlled using hand tools, to benefit native vegetation and wildlife, including Greater sage-grouse, pygmy rabbit, pronghorn antelope, and mule deer.
- Reseeding and replanting restoration sites, except for small areas where shrubs and other vegetation would be planted by hand, to the benefit of a variety of Native American resources.
- Creating fire and fuel breaks to reduce the risk of fire spread, except near existing roads or aspen stands, or along a few miles of stream, and using manual methods to reduce hazardous fuels and wildfire risk.

Under Alternative C, the BLM would not substantially improve the native vegetation community nor stop the loss of important ecosystem components, including native vegetation and fish and wildlife habitat. As a result, the health and abundance of Native American traditional/cultural resources would be expected to decline from current levels.

3.24.3.3.5 Direct and Indirect Effects under Alternative D (No Action Alternative)

There would be no direct or indirect effects on Native American traditional/cultural values, practices, and resources from 3 Bars Project treatments as no treatments would be authorized under this alternative. The BLM would not create fire and fuel breaks; thin and remove pinyon-juniper to promote healthy, diverse stands; slow the spread of noxious weeds and other invasive non-native vegetation, especially cheatgrass; restore fire as an integral part of the ecosystem; or reduce the risk of a large-scale wildfire that could be detrimental to Native American resources. Under Alternative D, the BLM would not improve the native vegetation community nor stop the loss of important ecosystem components, including native vegetation and fish and wildlife habitat. As a result, Native American traditional/cultural values, practices, and resources would not see benefits under this alternative.

3.24.3.4 Cumulative Effects

The CESA for Native American traditional/cultural values, practices, and resources is approximately 3,202,529 acres and includes the 3 Bars Project area and an area of north-central Nevada that encompasses the Kobeh Valley on the south, the Tuscarora Mountains on the north, the Shoshone Range on the west, and the Pinon Range on the east, based on consultation with local tribes for the Mount Hope Project and other projects in the region (USDOI BLM 2012b:4-9; **Figure 3-1**). Approximately 72 percent of the area is administered by the BLM, 27 percent is privately owned, and less than 1 percent is administered by the USDOI Bureau of Reclamation. Past and present actions that have influenced land use and access in the 3 Bars ecosystem are discussed in Section 3.3.2.3.3.

3.24.3.4.1 Cumulative Effects under Alternative A (Preferred Alternative)

Historic livestock grazing practices and wild horse overpopulation have contributed to the degradation of riparian and aspen habitat, establishment and spread of noxious weeds and other invasive non-native vegetation, and the expansion of pinyon-juniper beyond its historical ranges, to the detriment of fish and wildlife used by Native Americans on Roberts Mountains and elsewhere in the CESA. To improve forage and water resources, the BLM would continue ongoing management reviews to ensure proper livestock management and long-term treatment success.

The BLM would also continue to conduct wild horse gathers, AML reviews and adjustments, remove excess animals and use fertility control, improve water developments, and implement habitat projects. A small portion of the Roberts Mountain HMA is on Roberts Mountains, and wild horses use portions of Roberts Mountains that are outside of the HMA, especially when the wild horse population exceeds the AML. Efforts to distribute wild horses more evenly across the rangeland should help to reduce grazing pressure on Roberts Mountains. However, the Mount Hope Project would exclude wild horses from about 14,000 acres for up to 70 years, and as a result wild horses may spend more time in the Roberts Mountains in search of food and water, potentially to the detriment of vegetation used by Native Americans.

The BLM would treat noxious weeds and other invasive non-native vegetation on about 1,000 acres annually within the CESA. New infestations would typically be found in newly burned or disturbed areas, and in areas where livestock and wild horses congregate. These areas provide poor habitat for plants and animals used by local tribes. Tribal members could be impacted by herbicides, through indirect contact or consumption of treated foliage, but the BLM would post treatment areas and notify the tribes and public of proposed herbicide treatments to avoid or minimize impacts to human health. The risks to Native Americans are discussed in more detail in the 17-States PEIS (USDOI BLM 2007c: 4-149). Restoration of these areas using a combination of methods should help to restore these

lands back toward their Potential Natural Community (primarily sagebrush). As treatment areas recover, native game, including Greater sage-grouse, mule deer, pronghorn antelope, and pygmy rabbit, should return to these areas.

Public and private lands are used for a variety of recreation uses. Of most interest to local tribes would be the removal of vegetation that is used by tribes for traditional purposes, and the harvest of fish and game on public lands within the CESA. Recreational activities such as off-road travel could disturb native game and adversely affect Native American traditional practices. Use of public lands within the CESA is expected to increase due to normal population growth and from an influx of workers needed to support the Mount Hope Project and other reasonably foreseeable future projects.

Agriculture, land development, and mineral, oil, gas, and hydrothermal exploration and development could affect about 15,000 acres in the reasonably foreseeable future, including acreage associated with potential land sales (although it is unlikely that all of this land would be developed), new croplands, roads, and rights-of-way for power and telephone lines. These actions would affect traditional/cultural resources and values and would be of concern if they occurred on Roberts Mountains or on the Sulphur Spring Range, or in Kobeh Valley, three culturally significant areas within the 3 Bars Project area (Bengston 2007). In particular, there could be loss of vegetation used by local tribes, and of fish and wildlife and their habitats that are important to local tribes.

Approximately 8,300 acres would be disturbed by the Mount Hope Project, and another 6,000 acres fenced to exclude the public. Thus, about 14,000 acres used by large and small game would be made unavailable for use by local tribes for hunting. In addition, the mine could affect groundwater levels in the vicinity of the mine, potentially impacting vegetation on the Kobeh and Diamond Valleys, and affecting surface water flows on Roberts Mountains; these are culturally important areas to the Western Shoshone (Bengston 2007). These effects could last 70 years or more, and could impact plant, fish, and wildlife resources of importance to local tribes (USDOI BLM 2012b:4-69). The mine project would impact less than 1 percent of pinyon pines in the CESA. The mine site would be reclaimed, but habitat for big game and pygmy rabbit may be inaccessible or unavailable for 40 years or more. The mine proponent, BLM, and State Historic Preservation Office have developed a Programmatic Agreement to address many of these concerns.

The buildup of hazardous fuels and the spread of noxious weeds and other invasive non-native vegetation have increased both the risk of wildfire and the displacement of plants and animals that are important to Native peoples for maintaining their traditional/cultural practices and values. Although fire is being reintroduced to undeveloped areas in the West that were historically burned by Native peoples to maintain early successional plant species and improve habitat for game species, natural disturbance regimes have not been restored over much of the West. Encroachment by non-native species into natural ecosystems continues, to the detriment of many native species of importance to Native peoples.

Since 1985, wildfires have burned about 15,000 acres annually in the CESA, although the acreage burned annually can be quite variable. The risks to Native American traditional/cultural values from wildfire are much greater than for prescribed fires, as wildfires tend to be hotter and burn larger areas. Wildfires kill vegetation, and harm or displace the native fish and wildlife used by local tribes. In addition, it is often difficult to restore burned lands, due to their remote location and uneven terrain, and noxious weeds and other invasive non-native vegetation often out-compete and displace native vegetation, to the long-term detriment of resources used by Native Americans. Treatments that remove hazardous fuels, including decadent and diseased pinyon-juniper and cheatgrass and other non-native vegetation, and construction of fire and fuel breaks, would be expected to reduce the risk of catastrophic wildfire, to the benefit of Native American resources.

In addition to the approximately 127,000 acres that could be treated on the 3 Bars Project area to reduce hazardous fuels and restore ecosystem health, the BLM also proposes to treat hazardous fuels and improve habitat on an additional 15,000 acres under current or reasonably foreseeable future authorizations in high to very high fire risk areas, or collectively on about 4 percent of lands within the CESA. Most of these treatments would occur within pinyon-juniper and sagebrush management areas, including on Roberts Mountains and Sulphur Spring Range, areas with ethnographic significance to the Western Shoshone. As discussed under direct and indirect effects, hazardous fuel treatments could adversely impact traditional/cultural resources and values within the CESA, including singleleaf pinyon pines and Utah juniper that are used for their seeds and berries. Treatments could also impact fish and game resources, including mule deer, pronghorn antelope, and pygmy rabbit, which are used for food by local tribes. As discussed under Native and Non-invasive Vegetation Resources (Section 3.12) and Wildlife Resources (Section 3.16), treatments would have short-term effects on vegetation and wildlife habitat and displace game species, but within a few years conditions within treatment areas should improve and provide improved vegetation and fish and wildlife habitat. The beneficial effects of treatments would be greatest under Alternative A.

3.24.3.4.2 Cumulative Effects under Alternative B (No Fire Use Alternative)

Under Alternative B, effects from non-3 Bars Project reasonably foreseeable future actions on Native American traditional/cultural values, practices, or resources would be similar to those described under Alternative A. Under Alternative B, less effort would be spent by the BLM on treatments to reduce wildfire risk and its impacts on vegetation and fish and game habitat, including use of fire to restore natural fire regimes.

Adverse effects to Native American traditional/cultural values, practices, and resources within the CESA would generally be the same as described for Alternative A. By not using fire on the 3 Bars Project area, however there would be no risks to vegetation from fire on up to several thousand acres annually within the project area. Fire could be used on a few hundred acres annually outside the 3 Bars Project area.

By not using fire to reduce hazardous fuels and improve vegetation resiliency to fire, there would be greater potential for more extensive and intense wildfires to occur in place of controlled burns on the 3 Bars Project area under this alternative compared to Alternative A. This could lead to loss of vegetation and fish and wildlife habitat of importance to local tribes. 3 Bars Project actions would only affect about 63,500 acres, or 2 percent of the CESA. The BLM would consult with local tribes, and treatment areas would be surveyed, prior to treatment to avoid or reduce impacts to Native American traditional/cultural values, practices, and resources. Thus, there should be negligible cumulative effects to these resources from 3 Bars Project actions. These effects would be less than under Alternative A, but greater than under Alternative C.

3.24.3.4.3 Cumulative Effects under Alternative C (Minimal Land Disturbance Alternative)

Under Alternative C, effects from non-3 Bars Project reasonably foreseeable future actions on Native American traditional/cultural values, practices, or resources would be similar to those described under Alternative A. Adverse, short-term effects to vegetation associated with the use of fire and mechanized equipment would not occur under Alternative C. However, fire and mechanized equipment would be used in other portions of the CESA to improve habitat, remove hazardous fuels, and reduce the risk of wildfire.

By not being able to use mechanical methods and fire to reduce hazardous fuels, improve vegetation resiliency to fire, create fire and fuel breaks, and remove downed wood and slash, however, the risk of wildfire and its impacts on

Native American traditional/cultural values, practices, or resources would likely increase on the 3 Bars Project area, to the potential detriment of vegetation and fish and wildlife and their habitats within the CESA.

About 32,000 acres would be treated on the 3 Bars Project area, and another 15,000 acres in other portions of the CESA, to reduce hazardous fuels and to improve ecosystem health, or only about 1 percent of the CESA. The BLM would consult with local tribes, and treatment areas would be surveyed, prior to treatment to avoid or reduce impacts to Native American traditional/cultural values, practices, and resources. Thus, there should be negligible cumulative effects to these resources from 3 Bars Project actions and effects would be less than under Alternatives A and B.

3.24.3.4.4 Cumulative Effects under Alternative D (No Action Alternative)

Under Alternative D, effects from non-3 Bars Project reasonably foreseeable future actions on Native American traditional/cultural values, practices, or resources would be similar to those described under Alternative A. There would be no cumulative effects on Native American traditional/cultural values, practices, and resources from 3 Bars Project treatments as no treatments would be authorized under this alternative. The BLM could create fire and fuel breaks; thin and remove pinyon-juniper to promote healthy, diverse stands; slow the spread of noxious weeds and other invasive non-native vegetation using ground-based and aerial application methods of herbicides, especially cheatgrass; restore fire as an integral part of the ecosystem; and reduce the risk of a large-scale wildfire under current and reasonably foreseeable future authorized actions, but on a very limited acreage (about 1,500 acres annually; or about 0.03 percent of the CESA annually). Thus, benefits to Native American traditional/cultural values, practices, and resources would be negligible and least among the alternatives.

3.24.3.5 Unavoidable Adverse Effects

Unavoidable adverse effects could occur through inadvertent actions such as accidental removal of culturally significant plant species during mechanical methods or loss of important game habitat from burning. Treatments could also discourage or prohibit Native peoples from using these areas. However, all of these impacts would be short-term and would be far outweighed by the beneficial effects associated with long-term effects resulting from treatments that result in an increase in the abundance and diversity of native plant, wildlife, and aquatic resources.

3.24.3.6 Relationship between the Local Short-term Uses and Maintenance and Enhancement of Long-term Productivity

Vegetation treatments under all alternatives could have short-term impacts on vegetation used for traditional lifeways. Manual treatment methods have the least potential to impact plant species of importance to Native American traditional/cultural values, practices, or resources. These methods would be used to thin pinyon groves and, while there could be a short-term adverse effect from treatments, there would be a long-term benefit in pine nut harvesting associated with increased production; this would far outweigh the short-term effects. Biological treatments would have the least impact on short-term use, while prescribed and wildland fire and mechanical treatments have the potential to have the greatest effect on short-term use. Fire treatments could displace Native peoples from traditional use areas until the area is safe to reenter, or desirable vegetation was reestablished. However, the long-term restoration of native plant communities and natural ecosystem processes that benefit traditional plant and animal resources should compensate for the short-term losses in use and access.

3.24.3.7 Irreversible and Irretrievable Commitment of Resources

The use of treatments could inadvertently harm desirable edible plants, fish, and other fauna used for traditional lifeways or basketweaving. Prescribed burning and use of wildland fire for resource benefit would result in short-term habitat degradation and loss of plants and animals. However, these losses would be reversible as habitats would improve (USDOI BLM 2007c:251-252). Inadvertent impacts would only affect a small percentage of the treated acreage, and these impacts would be reversible. Further, the long-term benefits associated with all treatments that reduce the cover of noxious weeds and other invasive non-native vegetation, restore native vegetation, restore natural fire regimes, and restore long-term ecosystem health would substantially improve the diversity and quantity of traditional flora and fauna of importance to maintaining Native American traditional/cultural values, practices, or resources.

3.24.3.8 Significance of the Effects under the Alternatives

3 Bars Project and other actions in the CESA could have a significant impact on Native American traditional/cultural values, practices, or resources if the actions restrict access to sites used for religious ceremonies and/or documented sacred sites, in some way impede the exercise of ceremonies at such sites, or affect the physical integrity of such sites; impacts traditional plant resources or ceremonial sites; alter the setting of sites; or introduce visual, noise, or atmospheric elements that are out of character with the religious ceremonies or that compromise the sacred values.

The only Traditional Cultural Property within the CESA is the Mount Tenabo Traditional Cultural Property, which is immediately northwest of the 3 Bars Project area. It is probably the single most culturally important landscape feature on the homeland of the Western Shoshone (Fowler 1986). No reasonably foreseeable actions are proposed for this area, thus, effects from reasonably foreseeable future actions within the CESA would not be significant under all alternatives.

Based on the number of acres treated, short-term impacts to plants, as well as habitats used by fish and wildlife, that are important to Native peoples would be greatest under Alternative A and least under Alternative D. However, as the long-term objective of treatments is to restore native plant communities and habitats, including those of traditional importance to Native peoples, these effects to traditional plant resources would not be significant under the alternatives, especially given the likelihood of greater risk of catastrophic wildfire, and loss of plant and animal resources used by local tribes, that would occur without the treatments.

The BLM and State Historic Preservation Office have entered into a Programmatic Agreement that outlines the stipulations that will be followed to ensure compliance with Section 106 of the National Historic Preservation Act for each phase of the 3 Bars Project (see **Appendix B**). According to the Programmatic Agreement, all treatments shall be conducted in a manner consistent with the BLM and State Historic Preservation Office Protocol. The BLM, in consultation with the State Historic Preservation Office, shall ensure that effects to cultural resources and properties of traditional religious and cultural importance are avoided through design, or redesign, or by other means in a manner consistent with the BLM and State Historic Preservation Office protocol. When avoidance is not feasible, the BLM, in consultation with State Historic Preservation Office, Native American Tribes, and interested persons, shall develop, or ensure that, an appropriate treatment plan is designed to lessen or mitigate project-related effects to these resources and properties. By following the Programmatic Agreement, the BLM would ensure that there are no significant direct, indirect, or cumulative effects to cultural resources and properties of traditional religious and cultural importance under all alternatives from 3 Bars Project actions. A similar Programmatic Agreement was prepared for the Mount Hope Project, and the BLM and other federal agencies with land interests within the CESA would develop similar

agreements, if needed, before conducting actions within the CESA that could impact cultural resources and properties of traditional religious and cultural importance.

3.24.4 Mitigation

Under all alternatives, the BLM shall implement the following measures in accordance with the Programmatic Agreement prepared for the 3 Bars Project and as discussed in Section 3.23.4, Cultural Resources, Mitigation.

3.25 Social and Economic Values and Environmental Justice

3.25.1 Regulatory Framework

The NEPA requires consideration of local plans and policies in the assessment of the social and economic effects of proposed activities involving federal lands (43 CFR § 1506.2). Federal, state, and local plans and guidelines that apply to social and economic values within the analysis area include the Eureka County 2010 Master Plan, including the updated Natural Resources, Federal or State Land Use, and Economic Development Elements; the Shoshone-Eureka RMP; and the Land and Resource Management Plan for the Toiyabe National Forest.

Chapter 6 of the Eureka County Master Plan, Natural Resource and Land Use Element, is designed to: 1) protect the human and natural environment of Eureka County, 2) facilitate federal agency efforts to resolve inconsistencies between federal land use decisions and County policy, and 3) provide strategies and policies for progressive land and resource management. The updated Growth Management, Public Facilities and Services, Economic Development, Land Use, and Housing Elements of the Eureka County Master Plan outline specific goals that pertain to the project. Guidance and input for this assessment have also been provided by Eureka County staff, the Board of Eureka County Commissioners, and the Eureka County NEPA Committee (Eureka County 2010).

On February 11, 1994, President Clinton issued Executive Order12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations. Executive Order 12898 tasks "each Federal agency [to] make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high adverse human health and environmental effects of its programs, policies, and activities on minority populations and low-income populations."

Executive Order 13045, Protection of Children from Environmental Health Risks and Safety Risks, instructs federal agencies to identify and assess environmental health risks and safety risks that may disproportionately affect children, and to ensure that their policies, programs, activities, and standards address disproportionate risks to children that result from environmental health or safety risks.

3.25.2 Affected Environment

3.25.2.1 Study Methods and Study Area

Information for this section is drawn from the Mount Hope Project EIS (USDOI BLM 2012b) and other sources as indicated. Where necessary, baseline socioeconomic data from the Mount Hope Project EIS has been updated, drawing from published sources as cited and from information provided by Eureka County.

Public concerns expressed during scoping included potential effects on the area's agricultural community and effects related to a temporary work force associated with project implementation. These issues and concerns were considered in developing the description of the Affected Environment.

Environmental justice is defined as the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies (CEQ 1998). The assessment of environmental justice reflects USEPA's Guidance for Incorporating Environmental Justice Concerns in USEPA's NEPA Compliance Analyses (USEPA 1998). That guidance suggests a two-step screening process to identify environmental justice concerns. This two-step process defines criteria for this issue, as follows:

1. Does the potentially affected community include a substantial minority and/or low-income population?
2. Are there potentially high and adverse environmental or human health effects associated with the proposed action?

If either of these criteria are unmet, there is little likelihood of environmental justice effects occurring. If the two-step process indicates a potential exists for environment justice effects to occur, further analyses are conducted to consider the following:

- whether the potential exists for these effects to fall disproportionately on minority or low-income members of the community or on tribal resources;
- whether the affected communities have had the opportunity to be sufficiently involved in the decision-making process; and
- whether communities currently suffer, or have historically suffered, from environmental and health risks and hazards.

The study area for direct, indirect, and cumulative social, economic, and environmental justice effects is the southern portion of Eureka County, from the BLM Elko District boundary to the Nye County line (**Figure 3-1**). Eureka County is long and narrow, approximately 128 miles from north to south, between 22 and 42 miles wide, and contains 4,182 square miles. Eureka County government provides public services throughout the County. There are no incorporated towns in Eureka County. The town of Eureka, the County seat and largest community in the County, and Crescent Valley, the other town within the County, are unincorporated towns as defined by Nevada statutes.[5] The town of Eureka is approximately 10 miles south of the southeast corner of the 3 Bars project area and the town of Crescent Valley is approximately 10 miles north (via unpaved road) from the project area's northwest corner. The community of Beowawe is also in the northern part of Eureka County, approximately 14 miles north of Crescent Valley and 6 miles south of Interstate 80.

[5] Nevada Revised Statute § 269.520. "Unincorporated town" or "town" means a specific area within a county in which one or more governmental services are provided by the county in addition to those services provided in the general unincorporated area of the county, for which the residents of such area pay through ad valorem taxes or for which other revenue is secured from within the area.

3.25.2.2 Minority Populations and Poverty

The number of residents in Eureka County that describe themselves as a member of a racial or ethnic minority and the incidence of poverty are both a lower percentage of the total population than comparable statewide and national levels (**Table 3-65**). No tribally owned lands, or mineral resources or lands or minerals held in trust for Native American Tribes by the federal government, are within or near the project area.

TABLE 3-65

Minority Population and the Incidence of Poverty in Eureka County, 2010

Geographic Area	Percent Racial or Ethnic Minority Population	Proportion of Population Below Poverty Level
United States	29.5	15.3
Nevada	45.9	14.8
Eureka County	15.9	10.1

Note: Racial minorities include all persons identifying themselves in the census as a non-white race, including "Black or African American," "American Indian and Alaska Native," "Asian," "Native Hawaiian and Other Pacific Islander," "Some other race alone," and "Two or more races." Ethnic minorities include persons who identify themselves as Hispanic or Latino. Persons of Hispanic or Latino origin can identify themselves as part of any race (including white) and as persons of Hispanic or Latino origin.
Source: U.S. Census Bureau (2011a, b, c, 2012).

Comparing the screening criteria outlined above to the local settlement patterns, demographics, and poverty characteristics of the resident population in the County, and absence of major construction or other activity having direct effects that would extend beyond the project area, suggests no need for further assessment of potential environmental justice concerns as related to the proposed 3 Bars Project. The BLM is conducting government-to-government consultations with local tribes. If environmental justice concerns are identified during consultations, they will be addressed during the EIS process.

3.25.2.3 Economic and Social Setting

Eureka County is the second least populous county in Nevada with a 2011 estimated population of 1,994 and a 2011 average population density of 0.48 residents per square mile (Nevada State Demographer 2012a). The 2011 population estimate is virtually unchanged from the 1,987 residents reported for the County in the 2010 census.

The town of Eureka initially developed in conjunction with the mining industry, but has been sustained through the years by the agricultural industry and local government. Farm and ranch households live on agricultural operations on private lands across the county, most of which are in the central portion of the county in the vicinity of Nevada State Route 278 (Eureka County 2010).

Eureka County's economy is predominately natural resource-based. Mining, farming and ranching, tourism, and many forms of outdoor recreation rely on the land and its resources. Agriculture, primarily growing high quality alfalfa and hay for sale and winter feed and cattle and sheep ranching, has historically served as a base for the Eureka County economy, with mining responsible for periods of economic prosperity and decline.

Mining plays a vital and complex role in the economy and culture of Eureka County. The two largest gold mining operations in the state, Barrick Gold's Goldstrike Complex and Newmont Mining's Carlin Trend Complex, are

located in northern Eureka County. However, most of the economic activity associated with these mines accrues to Elko County, which is also home to most of the employees. These and other mines provide substantial tax revenue for Eureka County, which is used in part to provide public services and facilities throughout the County.

Land ownership and management also factor prominently in Eureka County's economic and social setting. The federal government manages 79 percent of all land in Eureka County, providing habitat and other environmental functions and supporting a variety of consumptive and non-consumptive uses. About 21 percent of the land is privately owned, including lands in the "checkerboard" along the Union Pacific Railroad mainline in the northern portion of the county. State- and County-managed lands together comprise less than one-half percent of the total.

3.25.2.4 Population and Demography

Eureka County's population peaked at more than 7,000 residents in 1880, fell to a low of 767 residents in 1960, then trended upward through the 1990s. Between 2000 and 2005, the County's population declined by nearly 200 residents, but subsequently gained more than 500 residents to 1,987 in 2010. The decline in the County's population between 2000 and 2005 coincided with a suspension of operations at the Ruby Hill Mine.

Between 2000 and 2011, population trends in Eureka County's unincorporated towns and outlying areas mirrored both those of the entire County and employment trends in the mining industry. During this period, just over two-thirds of the County's residents lived in the town of Eureka and nearby rural areas in the southern portion of the County. In 2011, the town of Eureka had 611 residents, with 396 in Crescent Valley and 987 living elsewhere in the County (**Table 3-66)**.

In 2011, the average household size in southern Eureka County was 2.38 persons, which is smaller than the statewide average of 2.65 individuals (U.S. Census Bureau 2011a).

The racial composition of the resident population in southern Eureka County is more predominately white than that of the state as a whole. In 2010, 89.6 percent of area residents identified themselves as white, alone or in combination with one or more other races. That compares to 66.2 percent at the statewide level (U.S. Census Bureau 2011a).

The Nevada State Demographer prepares population estimates and population projections for Nevada's counties, cities, and unincorporated towns. The forecasts released in April 2012 anticipate a net gain of approximately 300 residents in Eureka County by 2020, with a further gain of 200 residents by 2030. The projected population gains initially parallel anticipated gains of 400 jobs in the County, on a place of work basis. Population growth is projected to slow thereafter (Nevada State Demographer 2012b).

TABLE 3-66

Eureka County Population, Selected Years, 2000 to 2011

Area	2000	2005	2011
Eureka County	1,651	1,485	1,994
Eureka Town	499	440	611
Crescent Valley	330	311	396
Remainder of the County	822	734	987

Source: U.S. Census Bureau (2011a, b), and Nevada State Demographer (2012a).

3.25.2.5 Economy and Employment

Mining dominates the Eureka County economy in terms of employment and earnings. Total employment in the County topped 5,300 jobs in 1997, nearly 4,400 of which were in mining. The concentration of employment in the mining sector is the result of the expansion of several gold mines along the Carlin Trend[6] in the northern part of the County, and whose employees reside, for the most part, outside of the County.

Data on the resident labor force and employment by place of residence are more reflective of the much smaller and more recent mining presence in southern Eureka County. Barrick Gold's Ruby Hill Mine is just outside the town of Eureka, and provides an economic and employment boost for southern Eureka County. Since 2006, the Ruby Hill Mine has been recovering gold from the East Archimedes ore body, and recently announced additional reserves which may support mining for several more years.

Eureka County's labor market conditions generally parallel trends in the mining industry, although they are more closely tied to activities in the southern part of the County. In 2005, when construction of the East Archimedes expansion of the Ruby Hill Mine was underway, the labor force stood at 674 and unemployment at 3.6 percent. The resident labor force has subsequently expanded to nearly 1,100, 65 percent over the 2005 levels, while unemployment remains relatively low 6.4 percent in February 2012 (**Table 3-67**).

TABLE 3-67

Eureka County Labor Force, Unemployed, and Unemployment Rate, Selected Years

	2007	2008	2009	2010	2011	2012 (Feb)
Labor Force	793	845	906	1,082	1,115	1,081
Unemployed	59	46	62	82	67	69
Unemployment Rate (%)	4.3	5.5	6.8	7.6	6.0	6.4

Source: U.S. Department of Labor Bureau of Labor Statistics (2012).

Based on the strength of Eureka County's economy, local unemployment rates are consistently lower than both the statewide and national averages; 6.0 percent in Eureka County for 2011, as compared to 13.5 percent statewide and 8.9 percent for the nation.

Eureka County personal income data by place of work statistics reflect the presence of the Barrick and Newmont mines in the northern part of the County, whereby most of the labor earnings paid by Eureka County employers flow out of the local economy. Over the 3-year period 2008 to 2010, more than 80 percent of the total wages and salaries paid by employers in Eureka County were to workers living outside the county. After additional adjustments, social security deductions, and other income such as interest and dividends, the total personal income of residents averaged approximately $66 million (**Table 3-68**).

[6] The Carlin Trend, one of the world's most productive gold mining districts, is a northwest trending belt of mineral deposits over 50 miles long and 5 miles wide extending through northern Eureka County into Elko County on the northwest and southeast.

TABLE 3-68

Eureka County Personal Income by Place of Residence, Selected Years (in millions of dollars)

	2008[1]	2009[1]	2010[1]
Earnings by Place of Work	441.1	463.9	453.6
Net Residency Adjustment	-347.8	-369.4	-357.3
Social Security Deductions	-43.9	-48.7	-48.0
Other Income to Residents	16.8	16.9	17.3
Total Personal Income - Residents	66.2	62.7	65.7
Per Capita Income	$37,227	$32,577	$32,876

[1]A negative residency adjustment reflects the net earnings of workers employed in Eureka County, but who reside elsewhere, primarily in Elko County, that are in excess of the earnings of Eureka County residents employed outside the County.

Source: U.S. Bureau of Economic Analysis (2012a).

Prior to the late 1990s, per capita personal income of Eureka County residents was higher than that for Nevada and the U.S. Eureka County residents have trailed the state and national norms since 2000. In 2010, the variance was 11 percent below the statewide average and nearly 18 percent below the national average (**Table 3-69**). A substantial decline in farm income between 2008 and 2009 was largely accountable for a decrease of more than $4,600 in per capita personal income (U.S. Bureau of Economic Analysis 2012b).

Although the mining industry is the dominant employer in the county, other sectors play important roles in supporting the County's economy, particularly in the southern portion of the County. These sectors include government and public education, retail trade and services, construction, and agriculture. The levels of economic activity and employment in sectors other than agriculture, particularly construction, have historically reflected changes in mining activity.

TABLE 3-69

Per Capita Personal Income, Eureka County, Nevada, and the United States

	2008	2009	2010
Eureka	$37,227	$32,577	$32,876
Nevada	$39,879	$36,533	$36,938
United States	$40,947	$38,846	$39,937

Source: U.S. Bureau of Economic Analysis (2012c).

Public sector employment, which includes federal, state, and local government and public school employment, increased through much of the 1990s, eventually peaking at approximately 275 (U.S. Bureau of Economic Analysis 2012d). Public sector employment subsequently fell to 166 in 2003 before climbing to 250 in 2011 (Nevada Department of Employment, Training and Rehabilitation 2012). Most of the public sector employment in Eureka County is based in the town of Eureka due to the location of the County administrative and other functions, the Eureka County School District, and some state agencies within the town. Farm employment accounted for 3.3 percent of all employment.

The local business sector in the town of Eureka is limited in diversity and scale, focused primarily on essential consumer, building, and automotive goods and services. Retail shopping opportunities include groceries, hardware and lumber, auto parts/fuel/supplies, and novelties and gifts targeted at tourists. There are also several restaurants and

other food service establishments, two bars, and a casino in town. Residents use the internet or travel to Elko, Reno, or elsewhere to access a wider selection of goods, financial services, and a broader range of medical and dental care (USDOI BLM 2012b).

The local business sector in Crescent Valley includes a convenience/gas store, a restaurant and bar, a trailer park, and a contractor and tire, lube and equipment rental establishment (Eureka County 2012). Tourism, recreation activities, attractions, and events in Eureka County include big and small-game hunting, fishing, sightseeing, off-highway vehicle use, visits to the Eureka Opera House and Sentinel Museum, general interest in the historic mining character of the community, and events such as the county fair, county youth fair, high school rodeo, and special events (e.g., car show and drag race, and shooting and archery tournaments [Eureka County 2012, USDOI BLM 2012b]). Travelers along U.S. Highway 50, including bicyclists and motorcyclists, contribute to the Eureka County economy. The economic stimulus generated by recreation and tourism cuts across several retail and service industries; as a result, data regarding the levels of activity are not readily available.

Closely aligned with recreational activity on public lands is the harvest and collection of resources for personal use and enjoyment. Eligible resources include flowers, berries, pinyon and other nuts, seeds, cones, and other plant parts, campfire wood, rocks, mineral specimens, petrified wood, Christmas trees, semiprecious gemstones, and common invertebrate fossils. Harvesting of berries, nuts, and other plants and plant material is an important customary and traditional use of public lands for Native Americans.

3.25.2.6 Farming and Ranching

Local agriculture is an important element of the area's economic base. Although agriculture's importance may not always be reflected on a strict accounting basis and farm income is sensitive to outside influences and varies year to year, farming and ranching provide livelihoods for many households, support local government and public education by contributing to the local tax base, and indirectly support other local businesses through purchases of farm equipment, fuel, veterinary services, and other goods and services. Since members of agricultural households often work "off the ranch" for additional income, they are also a source of labor for other employers. A study of economic linkages in Eureka County reported that each direct job on local farms and ranches supported between 0.28 and 0.68 jobs elsewhere in the local economy, and that every $1 in economic output resulted in another $0.66 to $1.02 in secondary economic impact (Fadali et al. 2005). Examples of such linkages include local purchases of diesel fuel, lubricants, tools, other farm supplies, and groceries from local merchants and service providers, as well as electrical power used for irrigation purchased from Mt. Wheeler Power. Furthermore, the farm-based population tends to be connected to the land in ways that anchors it to the area more so than households associated with other elements of the economy.

Farm employment in Eureka County has experienced some volatility since 2000, declining for several years at the beginning of the decade, but increasing thereafter. As a consequence, farm employment in 2010 was reported at 163, a net increase of 30 farm jobs, or 23 percent, as compared to 2000.

The USDA National Agricultural Statistics Service (2009) reported 86 farms and ranches in Eureka County in 2007, up from 73 in 2002. Together those 86 operations reported operating a total of 783,440 acres, which corresponds to an

average farm size of 9,110 acres.[7] Eureka County farmers and ranchers reported just under $27 million in livestock, commodity, and other agricultural product sales in 2007 and out of 17 counties in Nevada, Eureka County was ranked fourth in the state in terms of crop value. The combined sales of livestock and products rose to $32 million in 2008, declining to $24.1 million in 2010. Revenue derived from livestock sales generally accounts for about one-third of the aggregate sales by local farms and ranches, and receipts from crop sales account for about two-thirds of the total. Cattle account for most of the livestock raised in Eureka County with sheep and horses accounting for most of the remainder. Approximately 35,000 acres of farmland are devoted to forage production (U.S. Bureau of Economic Analysis 2012b).

Eureka County growers are known to raise high quality alfalfa and other hay that is marketed out-of-state to dairies and horse breeders, as well as exported internationally. Data for Eureka County in 2011 indicated a total of approximately 42,400 acres devoted to raising crops; hay (31,200 acres) and alfalfa (10,400 acres) being the two primary crops (USDA National Agricultural Statistics Service 2012a). More than 70 percent of the total land planted in crops was in the Diamond Valley and elsewhere in southern Eureka County. As shown in **Figure 3-52**, Eureka County alfalfa production has ranged from a 2004 low of slightly over 60,000 tons, to a peak in 2007 of over 100,000 tons. Production in 2011 was 77,000 tons, comparable to the annual average for the period 1995 to 2011. Weather, including an extended period of drought, was largely responsible for much of the year-to-year variation in hay production over the past decade.

Eureka County livestock production over the past 11 years peaked at 37,000 units in 1999 and 2000, but has since decreased to 25,000 units in 2011 (see **Figure 3-53**)[8]. As in the case of hay production, some of the changes in the number of cattle produced reflect the effects of drought, as some ranchers adjusted to the availability of hay. Historically, substantial numbers of both sheep and cattle were raised in Eureka County but more recently cattle have become predominant. **Table 3-70** summarizes farm income and expenses from 2007 to 2010 for farms in the study area.

It is not uncommon for households dependent on agriculture to derive income from multiple sources, with one member engaged in farming/ranching and another working in education, government, or mining, for example. In fact, some residents note that having an "off-the-ranch" income is economically imperative, particularly recently when agricultural production and income have been adversely affected by the extended drought.

[7] The 783,440 acres in farms in 2007 is over 500,000 acres more than was reported in 2002 and exceeds the approximate total of 550,000 acres of privately owned land reported by Eureka County (2010). The reason for this discrepancy is unclear.

[8] The information regarding livestock production for 2007 to 2011 is of questionable reliability due to cutbacks in federal funding that has affected data collection, analysis, and reporting of agricultural production.

3.25.2.7 Housing

Eureka County had a total of 1,076 housing units in 2010, a net increase of 51 units compared to the 2000 Census (U.S. Census Bureau 2002; 2011a). Most of the net change was in multi-family units built in the town of Eureka. According to the Census Bureau, just over half of all units were single family residences, mobile homes accounted for 40 percent of all homes, and multi-family units about 7 percent. Vacancy rates are low across the County. The County is working with the Nevada Rural Housing Authority to develop new housing and commercial development in the Eureka Canyon subdivision located on the north end of the town of Eureka.

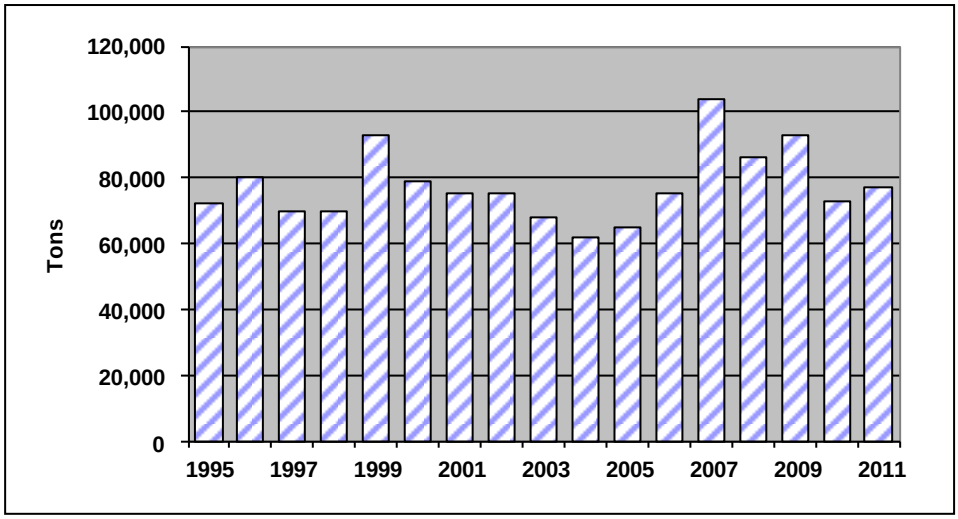
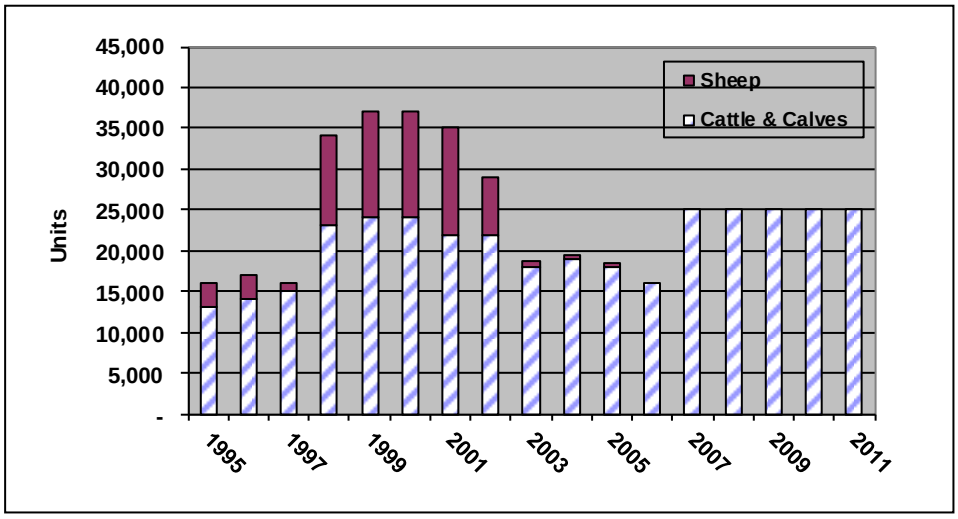


Figure 3-52. Eureka County Alfalfa Production 1995 – 2011.



Source: USDA National Agricultural Statistics Service (2012a).

Figure 3-53. Eureka County Livestock Production 1995 – 2011.
Source: USDA National Agricultural Statistics Service (2012b).

TABLE 3-70

Farm Income and Expenses, Eureka County 2007 to 2010 (x $1,000)

	2007	2008	2009	2010
Cash receipts from livestock and products	$ 9,460	$ 7,965	$ 7,878	$ 9,000
Cash receipts from crops	17,341	24,056	17,808	15,124
Other income	1,344	880	1,675	1,084
Production expenses	22,325	23,216	23,888	23,001
Value of inventory change	-3,063	-412	517	-121
Net income of corporate farms	629	1,484	457	390
Net farm proprietors income	2,128	7,789	3,533	1,696

Source: U.S. Bureau of Economic Analysis (2012b).

Accommodations for tourists and visitors, including four motels offering a total of 88 rooms, are in the town of Eureka (Eureka County 2010). Four mobile home and recreational vehicle parks provide nearly 100 spaces for short- and long-term rental. During the peak summer travel and hunting seasons, the short-term accommodations are frequently at or near full occupancy. A 36-space mobile home park in the town of Eureka was refurbished by Eureka Moly Limited Liability Corporation (LLC), and two additional recreational vehicle parks were recently refurbished or built. Much of the recent housing activity is being prompted by the potential development of the Mount Hope Project north of Eureka, in the vicinity of the 3 Bars Project area (USDOI BLM 2012b). There is one recreational vehicle park in Crescent Valley.

3.25.2.8 Eureka County Facilities, Services, and Public Utilities

Eureka County is governed by a three member Board of County Commissioners elected at-large to overlapping 4-year terms. Each year the Board selects one of its members to serve as Chairperson. County government provides a broad range of services to the two unincorporated towns and to the County as a whole. To provide these services, Eureka County employed 92 full-time employees and 45 casual employees in fiscal year 2011. The County also uses contractors and various service vendors. Within the County, the three largest functions in terms of full-time employees were public works (25), public safety (22), and general government (18). Public works includes the County's road and bridge department, as well as staff associated with water and wastewater utilities, solid waste control, fairgrounds, and county buildings and grounds (Eureka County 2011).

3.25.2.8.1 Law Enforcement and Criminal Justice

The Eureka County Sheriff's Office is based in the town of Eureka and provides law enforcement for the entire County, operates the County's detention facilities, and provides dispatch services for all County public safety functions including police, emergency medical, and fire suppression activities. The District Attorney, District Court, and Juvenile Probation office are also based in the town of Eureka.

3.25.2.8.2 Emergency Response

Emergency response includes fire protection and emergency medical/ambulance services. Eureka County funds an emergency management services coordinator to oversee emergency planning, response, and management among the

various local service providers, serves as a liaison with various statewide entities, and directs the volunteer ambulance/emergency medical service in Eureka.

3.25.2.8.3 Fire Protection

Eureka County funds six local volunteer fire departments. In addition to departments in the town of Eureka and Diamond Valley, volunteer fire departments are located in Beowawe, Crescent Valley, Dunphy, and Pine Valley.

The Eureka Volunteer Fire Service (VFS) and the Diamond Valley VFS service southern Eureka County. The Eureka VFS provides fire suppression service in and around the town of Eureka and accompanies the ambulance on motor vehicle accident calls. During dry years, the VSF frequently responds to calls to fight wildfires. The Eureka VFS is staffed by volunteers and is housed in a two-story, seven-bay fire station commissioned in late 2009.

The Diamond Valley VFS located on 11th Street in Diamond Valley. The Diamond Valley VFS maintains a three-bay fire station that accommodates five vehicles including an ambulance. Most calls to the VFS are for vehicle accidents along State Route 278 and for wildfires (USDOI BLM 2012b).

These departments, along with the Nevada Department of Forestry and BLM, maintain mutual-aid agreements to augment the capacities of any given department when the need arises. Eureka County provides funds to the Nevada Department of Forestry to help fund its fire suppression activities.

3.25.2.8.4 Emergency Medical/Ambulance Services

Emergency medical care and transportation in the County are provided by the Eureka County Emergency Medical Service, a volunteer ambulance service. In the southern part of the County, the Emergency Medical Service is staffed by the full-time paid Eureka County Emergency Medical Service Coordinator and volunteers. Two ambulances and a search and rescue vehicle are housed in the town of Eureka. An older ambulance is stationed in Diamond Valley. The ambulances have radio communication with Northeast Nevada Regional Hospital in Elko, where most patients are transported. Fixed-wing and helicopter emergency medical air transportation is available to hospitals in Elko and Reno, Nevada, and Salt Lake City, Utah (USDOI BLM 2012b).

3.25.2.8.5 Health Care

Primary health care in southern Eureka County is provided at the Eureka Medical Clinic in the town of Eureka and operated by the Nevada Health Centers, Inc. The Eureka Medical Clinic facility was constructed in 1998 with funding from Eureka County. When fully staffed, the clinic employs a physician, a physician's assistant/clinic coordinator, two medical assistants, and an administrative employee. The clinic provides a full range of basic and emergency medical services.

Another health care clinic is in Crescent Valley. It is open on a part-time basis, staffed by practitioners from the Eureka Medical clinic who travel to the facility. Most patients requiring hospitalization use the Northeastern Nevada Regional Hospital in Elko. Patients requiring specialized care often choose to access facilities in Reno (USDOI BLM 2012b).

3.25.2.8.6 Public Education

Public education (kindergarten through 12th grade) in Eureka County is provided by the Eureka County School District, headquartered in the town of Eureka. In addition to administrative offices, the Eureka County School District

operates an elementary school and a junior/senior high school in Eureka, which serve the southern portion of the County. The Eureka County School District also operates an elementary school in Crescent Valley, serving the Crescent Valley/Beowawe area. The Eureka County School District sends junior and senior high school students from the Crescent Valley/Beowawe area to the Lander County School District's schools in Battle Mountain and sends some Pine Valley area students to the Elko County School District Combined School in Carlin. Public school enrollment in grades kindergarten through 12th grade totaled 235 students in the fall of 2012, an increase of 6 students compared to the preceding year (Nevada Department of Education 2012).

3.25.2.8.7 Other Public Facilities and Services

Eureka County provides social and senior services from offices in Eureka. The County fairgrounds, a library, swimming pool, and other recreational facilities are also in Eureka.

Eureka County maintains and operates three water systems in the southern part of the County, the Eureka Town Water System and two general improvement district systems in the Devils Gate subdivision about 4 miles north of Eureka. The County also operates a water system in Crescent Valley.

Wastewater collection and treatment services in the town of Eureka are provided by a central system, with a multiple-cell, aerated, evaporative lagoon wastewater treatment facility managed by the County public works department. Developments in Crescent Valley and elsewhere in the County rely on septic systems.

Eureka County operates the Class II-rated Whiskey Flat Landfill north of the town of Eureka. The landfill is staffed by two County public works employees. The County has long-term plans to open a new landfill (USDOI BLM 2012b).

Mt. Wheeler Power provides electric power to central and southern Eureka County including the town of Eureka and the project area. Nevada Energy provides power to the Crescent Valley area. Residential and commercial gas is provided by private propane vendors. Conventional landline telephone service is provided by AT&T. Cellular phone coverage is available across much of the County except in Pine Valley along State Route 278.

3.25.2.9 Fiscal Conditions

Eureka County has a solid fiscal foundation. That strength derives from a combination of substantial revenues generated by the mining industry, a relatively low service population, and local governance policies focused on using revenues to fund essential countywide services and maintaining a strong reserve fund during periods of prosperity which can be used to cushion the budgetary impacts of mine closures or declining net proceeds or assessments.

Total County revenues have risen by nearly $10 million per year over the past 5 years, from $22.6 million in fiscal year 2006/2007 to $32.4 million in fiscal year 2010/2011 (**Table 3-71**). Eureka County's primary revenue sources are ad valorem taxes and intergovernmental revenues. These two categories of revenue have accounted for more than 85 percent of the County's total revenues in each of the past 3 years.

Ad valorem taxes are a function of the tax rate and assessed valuation. Local ad valorem tax rates are consistently the lowest or among the lowest rates in Nevada. In 2010/2011, the tax rate on property in the town of Eureka was $1.9896 per $100 of assessed valuation, 45 percent less than the state-mandated maximum of $3.64 per $100. All property owners benefit from the relatively low tax rates. Recognizing the potential volatility in revenues associated with mining activity, the Board of Eureka County Commissioners has a long-standing a policy to maintain relatively

steady property tax rates, funding reserve accounts during periods of prosperity that can be used to cushion the budgetary impacts of mine closures or declining net proceeds or assessments (USDOI BLM 2012b).

Over the past decade, Eureka County's total assessed valuation has grown dramatically as a result of capital investment in mining, higher production, and record high gold prices. In 2008/2009, the County's total assessed value reached $1.51 billion, more than a 150 percent increase in just 3 years. Driven by the increases in gold prices, the total valuation doubled to more than $3.1 billion for the 2010/2011 tax year and primarily the result of a large jump in net proceeds (**Table 3-72**).

In fiscal year 2010-11, agricultural lands and improvements accounted for approximately 1.9 percent of Eureka County's total assessed value, if the net proceeds from mining are excluded. If net proceeds of mining are included, agriculture's share is 0.5 percent (Nevada Department of Taxation 2012).

As a result of the growth in assessed value, ad valorem taxes levied by Eureka County increased from $7.1 million in fiscal year 2006/2007 to $18.5 million in fiscal year 2010/2011. The latter is a record high. Combining the real and personal property valuations associated with the mining industry and net proceeds reveals that the mining industry accounts for approximately 90 percent of the total ad valorem tax base of the County and Eureka County School District.

TABLE 3-71

Eureka County Budget Summary, Fiscal Years 2007 to 2011

	2006/2007	2007/2008	2008/2009	2009/2010	2010/2011
Total Revenues	$22,566,806	$24,495,445	$32,088,413	$29,242,039	$32,362,380
Total Expenditures	14,439,988	21,468,845	24,651,142	28,202,042	27,824,071
Net Current Revenue	8,126,818	3,026,600	7,437,271	1,039,997	4,538,309
Reserve Fund Balance (Ending)	46,551,069	49,592,669	57,036,340	56,326,337	59,625,419

Source: Eureka County (2011).

TABLE 3-72

Eureka County Assessed Value, Fiscal Years 2005/2006 through 2010/2011 (in millions of dollars)

Fiscal Year	Secured[1]	Unsecured, Including Net Proceeds of Mines[1]	Total
2005/2006	$273.4	$322.6	$596.0
2006/2007	333.8	488.9	822.7
2007/2008	381.9	653.0	1,034.9
2008/2009	473.1	1034.4	1,507.5
2009/2010	583.7	832.6	1,416.3
2010/2011	546.2	2,627.2	3,173.4

[1] Secured property generally refers to real property, mobile homes placed on foundations, and some improvements held by a title. Unsecured property generally refers to personal property, mobile homes not placed on foundation, and other property interest subject to property tax.

Source: Nevada Department of Taxation (2012).

Intergovernmental revenues, the second major category of revenues for Eureka County, increased from $11.6 million in fiscal year 2005/2006 to $13.3 million in fiscal year 2009/2010, falling to $9.7 million in fiscal year 2010/2011. Intergovernmental revenues from the state include the Basic County-City Relief Tax, Supplemental County-City Relief Tax, motor vehicle property taxes, and fuel taxes. Basic County-City Relief Tax and Supplemental County-City Relief Tax are statewide sales and use taxes enacted to provide property tax relief. Intergovernmental revenues also include various federal payments and grants, including receipts of federal Payments in Lieu of Taxes. In 2010, federal Payments in Lieu of Taxes payments totaled $275,208, based on 2,156,915 acres of qualifying federal lands (USDOI BLM 2012b).

Eureka County expenditures have also increased in recent years from $14.4 million in 2006/2007 to $27.8 million in 2010/2011, the rise generally tracking the growth in revenues over time (**Table 3-71**). Budgeted expenditures increased across all major functions/departments. Much of the increase is accounted for by non-recurring outlays for facility and road improvements funded from current revenues and the County's accumulated reserves for such purposes. Eureka County completed several major capital improvement projects in recent years. These projects included a new Eureka Fire House, water storage and distribution projects in Eureka, a Main Street water/sewer project in Eureka, arsenic treatment projects in the Devils Gate and Crescent Valley water systems, and a Countywide chip seal project.

Net current revenues, defined as total revenues less total expenditures, ranged between $1.0 and $8.1 million over the past 5 years (**Table 3-71**). For fiscal year 2010/2011, the net current revenue was $4.5 million. After accounting for other financing sources or outlays, the residual net revenue was transferred to the County's reserve funds. The County's combined reserve fund balances stood at $59.6 million at the end of the 2010/2011 fiscal year.

A small portion of the reserve fund is held as a reserve against an outstanding note receivable; however, the majority of the funds is unreserved, and are held for potential use in meeting future general fund needs, capital projects, and other special needs as established by the County Commission. The County had no bonded debt as of June 30, 2011.

3.25.2.10 Social Conditions and Affected Publics

This section generally describes existing social conditions in Eureka County and groups that could be affected by the 3 Bars Project. Information for this section was obtained from interviews (between 2006 and 2008) with local officials, County staff and local residents, and from a review of secondary sources (Blankenship Consulting LLC and Sammons/Dutton LLC 2008).

Southern Eureka County, including the town of Eureka and Diamond Valley, is a close-knit community where many residents know each other because of their long association with the community. There are a number of multi-generational families in the community, some whose roots date back to the original settlement of the area by people of European descent. Many southern Eureka County residents are deeply involved in the community. It is not uncommon for an individual to be a hay grower or business person, serve as an elected official or be an appointed member of a board or committee, and also serve as a member of a volunteer fire department, search and rescue team, or other civic organization.

Although the town of Eureka hosts tourists and highway travelers during summer months and experiences periodic influxes of mine workers from area mines, it endeavors to maintain its small town traditions and lifestyles. Many residents enjoy knowing many of their neighbors and value the low crime rate and the casual atmosphere of the town.

On the other hand, some community members are concerned that many of the community's youth move away to find suitable employment and would like to have a somewhat larger student body at the high school to support a broader curriculum. The limited range of commercial, dining, and entertainment options, is a drawback for some residents.

Specific public and groups identified during scoping and interviews as potentially affected by development and operation of the mine include:

- Eureka County ranchers who hold grazing permits for the allotments within the 3 Bars Project area.
- Individuals and businesses that provide goods and services to the agricultural sector.
- Individuals and businesses that may provide goods and services to contractors or the BLM personnel involved in the restoration efforts.
- Recreational users of the 3 Bars Project area. These users mainly include hunters, some off-highway vehicle users (all-terrain vehicle and snowmobile) and visitors, and re-enactors and supporters interested in the Pony Express National Historic Trail, which traverses the project area.
- Individuals and businesses that provide goods and services to outdoor recreational users of the 3 Bars Project area.

3.25.3 Environmental Consequences

Public lands play an important role in the economy, social structure, and quality of life for area residents as well as for tourists and other visitors to the area. The economic contributions derived from use of public lands, including expenditures by local and non-local recreational users, provide support for local ranching, mining, and other natural resource uses. The "wide open spaces" that are common across the West and that are comprised largely of public lands also contribute to the "sense of place" that is important to residents and nonresidents alike. Because of the important ties between public lands and communities and residents, actions that affect public lands, including landscape restoration activities, may have social and economic consequences in the region.

Implementation of the proposed vegetation treatment program would create temporary and long-term effects on land use patterns, resulting in short-term socioeconomic effects. However, effects would also result from non-action, although the timing, extent, and location of these effects are subject to a higher degree of uncertainty. Consequently, the socioeconomic assessment seeks to describe the trade-offs involved between action and no action.

3.25.3.1 Key Issues of Concern Considered during Evaluation of the Environmental Consequences

Specific stakeholder groups identified during scoping as potentially affected by the restoration initiatives include:

- Individuals and businesses providing goods and services to the BLM in conjunction with the landscape restoration projects.
- Farmers and ranchers in the Kobeh and Diamond Valleys, who raise livestock and grow alfalfa, hay, or other grasses, including high quality dairy and export grade hay.
- Grazing operators who manage cattle on BLM grazing allotments in the 3 Bars Project area.
- Businesses that provide goods and services to local farming and ranching operations.

- Recreational users of the area around the 3 Bars Project, including hunters, anglers, off-highway vehicle users, sightseers, and re-enactors and supporters of the Pony Express National Historic Trail, which traverses the 3 Bars Project area.

The key issues of concern regarding socioeconomics identified by stakeholders during scoping include:

- Recognize the contributions of the existing agriculture industry to the economic and social structure of Eureka County.
- Recognize the economic and social benefits of other land uses and activities that occur in the area.
- Consider the potential short- and long-term economic effects of the treatment alternatives on ranch operators.
- Consider the local job opportunities and economic development effects supported by the landscape treatment alternatives.
- Plan and schedule vegetation treatments and coordinate with grazing permittees to limit the extent of short-term economic disruptions.
- Consider the overall cost of the restoration project and how the project would be funded.

3.25.3.2 Significance Criteria

The NEPA (Section 1508.14) states that "...economic or social effects are not intended by themselves to require preparation of an environmental impact statement. When an environmental impact statement is prepared and economic or social and natural or physical environmental effects are interrelated, then the environmental impact statement would discuss all of these effects on the human environment." This means that social or economic differences are not enough to result in a potentially significant adverse effect, but need to manifest themselves with some physical change, as described in the NEPA (Section 1508.8[b]), "...effects may include growth inducing impacts and other effects related to induced changes in the pattern of land use, population density or growth rate."

The proposed action would be considered to have a significant effect on social and economic values if the following occurred:

- Substantial long-term change in any sector of the local economy, such as major expansion or contraction of employment, output, or diversity.
- An increase in temporary or resident populations that would unduly strain the ability of affected communities to provide housing and services or otherwise adapt to growth-related social and economic changes.
- An aggregate change in public sector revenue and/or expenditure flow likely to either compromise the ability of affected units of government to maintain public services and facilities at established service levels, or to compromise their ability to allow for improved services without increasing the tax burdens on existing taxpayers.
- Permanent displacement of residents or users of affected areas that would result from project induced changes in or conflicts with existing uses or ways of life.

The significance threshold would be triggered if any one of the above criteria were satisfied.

3.25.3.3. Direct and Indirect Effects

3.25.3.3.1 Direct and Indirect Effects Common to All Action Alternatives

Adverse Effects

Because the 3 Bars Project area is rural and largely undeveloped, potential adverse social effects related to restoration would be indirect and largely intangible, and would most likely affect general degrees of satisfaction or dissatisfaction of individuals, families, and various stakeholders. In general, the social and economic effects associated with the management types and treatment methods would be similar in type, varying in degree based on the cost of treatment and the acres of area treated.

There could be short-term reductions in authorized grazing levels and subsequent downward pressure on ranch income as a result of grazing restrictions and increases in the required amount of livestock management. It is estimated that the total economic cost to ranchers and the local economy would be $69.57 per AUM, much of which would accrue to the regional economy of northeastern Nevada. This value differs from the $53.40 (1999 dollars) and $73.75 (2012 dollars) values given in the Mount Hope Project Final EIS. Those values were based on the Nevada Grazing Statistics Report and Economic Analysis for Federal Lands in Nevada (Resource Concepts, Inc. 2001) and an adjustment for general inflation. However, the original $53.40 value was determined to be incorrect because of double-counting of the industry's labor income and value-added when Resource Concepts, Inc., reported total output as defined by the Impact Analysis for Planning (IMPLAN) model. By adding the three lines items together, all other things remaining the same, the net result is that the economic values of an AUM to regional output were overestimated in the Mount Hope Project Final EIS. To correct the issues associated with the Resource Concepts, Inc., values, the updated value of $69.57 per AUM was derived based on average beef prices over the period January 2004 to January 2013, as compared to the 1999 base value used by Resource Concepts, Inc. (USDA National Agricultural Statistics Service 2013), and an updated local economic output multiplier of 2.02 as compared to the statewide multiplier of 1.82 reported by Resource Concepts, Inc. (Fadali 2005).

The BLM would experience short-term, and possibly long-term, reductions in annual grazing fees as a result of reductions in the level of authorized grazing use during and following treatment. Existing linkages between grazing and ranch families in the Diamond and Kobeh Valleys, public lands and public lands management, and the Eureka community would continue, with short-term uncertainties regarding the timing and effectiveness of implementation, and potential long-term reduction in uncertainty regarding future grazing levels.

Social effects would include effects on ranchers, outfitters, individual recreationists, some business owners, local law enforcement and fire departments in Eureka County, and others affected directly and indirectly by changes in access, temporary closures, or other restrictions associated with the mechanical and fire treatments. These effects would manifest themselves in terms of concerns for social and economic well-being, increased satisfaction or dissatisfaction with public lands management by the Mount Lewis Field Office, and quality of life in general. Some individuals may also experience dissatisfaction with the types and locations of treatments proposed.

Treatments could occur within designated harvest units for woodland products, as discussed in Section 3.12. There is a large degree of overlap between harvest units and pinyon-juniper treatment areas. As a result of thinning treatments, the number of pinyon pine and juniper trees within harvest areas would be reduced, although woodland products would still be available over portions of treatment areas. Treatments would affect approximately 26 percent of the total designated woodland products harvest area during the life of the project. Removal of pinyon pines and juniper

from these areas would eliminate or limit the ability to harvest woodland products there, although a large portion of the potential treatment area would not be affected. Additionally, other nearby areas in the Battle Mountain District, which make up a substantial portion of the annual harvest area, would not be affected by treatments under the 3 Bars Project.

None of the action alternatives would cause substantive changes to existing patterns and trends in local population and demographic conditions in Eureka County. The employment opportunities associated with implementation of the restoration initiative would generally be temporary and unlikely to substantially affect migration to or from the region.

Beneficial Effects

The project would generate a short-term temporary local economic stimulus (e.g., purchases of materials and supplies, equipment-related rentals and leases, and retail and lodging expenditures) associated with BLM and contractor efforts and jobs. Locally, these benefits would accrue primarily to residents and businesses in southern Eureka County. At a national level, the short-term effects on employment and income would not necessarily represent benefits, but rather transfers funded through the BLM's budget process.

In addition, pinyon-juniper trees with potential for use as fence posts or for firewood could be gathered up and offered for sale to the public, providing additional benefits to residents, local businesses, and landowners, including farmers and ranchers. Potential long-term benefits associated with future increases in the level of authorized grazing use would be dependent on the successful achievement of the treatment objectives.

It is assumed that restoration treatments would meet, to varying degrees, the identified need for reducing the risk of wildfire and improving ecosystem health. Restoration treatments would reduce the amount and concentration of hazardous fuels. As a result, the number, size, and severity of wildfires would be reduced, as would the cost of wildfire suppression and the risk of loss of life and property. The reduction in risk of a large-scale reduction in wildfire would benefit nearby private property owners and facilities constructed on public land, including facilities for mining and infrastructure, reducing the risk of property damage and interference with operations. Treatments that improve ecosystem health could increase or improve the amount and quality of commercial and casual uses of public lands, improve or maintain market and non-market values of public land resources, and reduce the cost of operations on public lands (USDOI BLM 2007c:4-124).

3.25.3.3.2 Direct and Indirect Effects under Alternative A (Preferred Alternative)

The BLM would treat on average about 127,000 acres annually using all available methods under Alternative A. The 2- to 4-fold increase in acres treated compared to Alternatives B and C, respectively, reflects the BLM’s ability to use lower cost treatment methods under Alternative A. For example, the BLM would be able to use prescribed fire (approximately $50 per acre) under this alternative, but not under Alternatives B and C. This is less than the costs associated with manual (cutting trees with a chainsaw, $200-1,000 per acre) and mechanical (mowing or chopping, $90 per acre; shredding, $300-350 per acre) treatment methods (**Table 3-73**).

Riparian Treatments

Riparian treatments would be relatively expensive on a per-acre basis, and would be completed using construction equipment and substantial levels of labor to complete stream channel reconstruction, rock placement for channel stabilization, and to install fencing to prevent access to treated sites by livestock, wild horses, and other wild ungulates. Based on stream restoration work done by NDOW, it could cost about $250,000 per mile for stream

channel restoration and plantings, and another $5,000 per mile for temporary fencing (**Table 3-73**; Lee 2013). Trees could be removed using chainsaws, and piled or used for stream restoration, at a cost of about $550, or shredded at a cost of about $300 to $350 per acre. If trees are piled and burned, this would add an additional $250 per acre.

TABLE 3-73

Estimated Treatment Costs per Acre

Treatment Method	Estimated Cost per Acre[1]
Manual	
Chainsaw and leave trees in place	$200[2]
Chainsaw, pile trees, and burn	$600 - $1,000 ($800)[2]
Pipe rail fencing	$9.39 per lineal foot ($4,957 per mile) [2]
Mechanical	
Sagebrush mowing or chopping	$90[2]
Drill seeding	$90[2]
Shred trees and shrubs	$300 - $350 ($325)[2]
Hand planting	$600[2]
Fire	
Prescribed fire	$50[2]
Pile burning	$200- $300[2]
Biological	
Insect, pathogen, and nematode	$80 - $300 ($150)[3]
Livestock	$15[2]

[1] Value in parentheses is the average value use to calculate costs of treatment methods.

[2] Source: Mount Lewis Field Office.

[3] Source: 17- States PEIS and PER (USDOI BLM 2007b, c). Cost estimates from 2005.

Adverse Effects

Short-term adverse socioeconomic effects include additional management efforts for ranchers associated with grazing management and with the potential need to establish and maintain new water sources for livestock.

Beneficial Effects

Stream channel restoration and bioengineering treatments would improve riparian habitat and stream water quality. These effects could benefit livestock, wild horses, and other wild ungulates, to the benefit of ranchers and the public. Removal of pinyon-juniper near streams and within floodplains would help to reduce wildfire risk and associated wildfire suppression costs and the risk of loss of life and property.

Aspen Treatments

Adverse Effects

Aspen treatments would be relatively expensive on a per acre basis, in part due to their small size, use of some mechanized equipment, substantial levels of labor, and the costs associated with the distribution of pinyon-juniper slash. It would cost about $200 per acre to use chainsaws to stimulate root suckering, and about $800 per acre to use

chainsaws to remove pinyon-juniper to slow encroachment and create fire breaks. Some of the slash from pinyon-juniper removal would be left in place to stimulate aspen root suckering and would lessen treatment costs compared to pile burning of trees.

Short-term adverse socioeconomic effects include additional cost and effort for ranchers associated with grazing management due to the placement of small, temporary exclosure fencing, and/or changes in season of use. Short-term reductions in the authorized level of grazing, and thus the potential for adverse effects on production and income from livestock, would be a function of the size of each treated area and the aggregate total of such areas treated within a specific allotment.

Beneficial Effects

Short-term benefits would include seasonal employment opportunities with the BLM, contracting opportunities for local residents and contractors, and income potential for businesses that support construction for lodging, eating, and drinking establishments, and for specialized aerial application contractors. Removal of pinyon-juniper near roads associated with aspen stands would help to reduce wildfire risk and associated wildfire suppression costs and the risk of loss of life and property.

Pinyon-juniper Treatments

Adverse Effects

Short-term adverse socioeconomic effects include cost and management effort for ranchers associated with grazing management in preparation for prescribed fires and mechanized treatments, changes in rest/rotation/seasons of use, and possibly the need for provisions to relocate or provide alternative livestock water. Short-term reductions in the authorized level of grazing, and thus the potential for adverse effects on production and income from livestock, would be a function of the size of individual treated areas, and the aggregate total of such areas treated within a specific allotment.

Beneficial Effects

Short-term benefits would include seasonal employment opportunities with the BLM, contracting opportunities for local residents and contractors, and income potential for businesses that support construction for lodging, eating, and drinking establishments. Economic benefits would occur to the local community from pinyon-juniper treatments. Additional economic benefit could come from the sale of pinyon-juniper trees with commercial market potential for fence posts and firewood.

Sagebrush Treatments

Adverse Effects

Short-term adverse socioeconomic effects would include additional cost and effort for ranchers associated with grazing management in preparation for prescribed fires and mechanized treatments, installing small, temporary exclosure fencing, changes in rest/rotation/seasons of use, and possibly the need for provisions to relocate or provide alternative sources of water to livestock. Short-term reductions in the authorized level of grazing, and thus the potential for adverse effects on production and income from livestock, would be a function of the size of individual treatment areas, and the aggregate total of such areas treated within a specific allotment.

Beneficial Effects

Short-term benefits would include seasonal employment opportunities with the BLM, contracting opportunities for local residents and contractors, and income potential for businesses that support construction for lodging, eating, and drinking establishments. Additional economic benefit could come from the sale of pinyon-juniper trees with commercial market potential for fence posts and firewood.

3.25.3.3.3 Direct and Indirect Effects under Alternative B (No Fire Use Alternative)

The cost per acre of treatment would be greater under Alternative B than under Alternative A. This reflects, in part, the higher expenditures associated with manual and mechanical treatments, which generally cost about 2 times or more per acre to implement than do fire treatments (**Table 3-73**).

Such outlays could increase the annual level of expenditures and the associated short-term employment and income and business revenue benefits associated with landscape restoration in the 3 Bars Project area. The level of financial and other resources devoted to implementation of actions under Alternative B would be minor relative to the overall economy in the 3 Bars Project area and surroundings.

Grazing permittees would experience short-term reductions in income in conjunction with the proposed treatments, particularly the pinyon-juniper treatments, which could necessitate reductions in herd size, the need to purchase additional private pasture or feed, and increases in management efforts and costs. The actual reductions would vary over time in response to the actual acreages treated in any given year. The BLM could experience reductions in grazing fee receipts as a result of the temporary reductions in grazing use, although the effects on grazing fee receipts are unknown due to uncertainties regarding the magnitude in reductions in grazing due to restoration efforts and future decisions regarding the allocation of available forage to competing uses.

Temporary and long-term social effects under Alternative B would be similar to those for Alternative A, although some individuals and stakeholder groups would be more or less satisfied by the preclusion of prescribed fire.

3.25.3.3.4 Direct and Indirect Effects under Alternative C (Minimal Land Disturbance Alternative)

The cost per acre of treatment would be greater under Alternative C than under Alternatives A and B. This reflects, in part, the higher expenditures associated with manual and classical biological control treatments, which generally cost 3 to 5 times or more per acre to implement than do fire and mechanical treatments (**Table 3-73**).

Due to the reduction in acres treated, the temporary reductions in grazing use associated with treatments would be lower, and the potential for other reductions due to declining rangeland health would persist. The actual reductions would vary over time in response to the actual acreages treated in any given year. The BLM would experience reductions in grazing fee receipts as a result of the temporary reductions in grazing use, although the effects on grazing fee receipts are unknown due to uncertainties regarding the magnitude in reductions in grazing due to restoration efforts and future decisions regarding the allocation of available forage to competing uses.

Over the long-term, treatments would do little to slow the declines in rangeland health and promote a stabilization of future grazing levels and support for rural lifestyles. Treatments would do little to improve habitat for fish and wildlife, conditions of woodland stands to the benefit of pine nut production and other woodland products, and aesthetic qualities of the landscape for the recreational and commercial resource users.

3.25.3.3.5 Direct and Indirect Effects under Alternative D (No Action Alternative)

There would be no direct effects on social and economic values from 3 Bars Project treatments as no treatments would be authorized under this alternative. The BLM would not create fire and fuel breaks; thin and remove pinyon-juniper to promote healthy, diverse stands; slow the spread of noxious weeds and other invasive non-native vegetation, especially cheatgrass; restore fire as an integral part of the ecosystem; or reduce the risk of a large-scale wildfire that could be detrimental to public resources. Treatments to improve 3 Bars ecosystem health and increase or improve the amount and quality of commercial and casual uses of public lands, improve or maintain market and non-market values of public land resources, and reduce the cost of operations on public lands, would not occur under this alternative.

3.25.3.4 Cumulative Effects

The CESA for social and economic cumulative effects is the southern portion of Eureka County, from the BLM Elko District boundary to the Nye County line, and includes the town of Eureka (**Figure 3-1**). The area is approximately 1,692,238 acres and approximately 86 percent of the area is administered by the BLM, 9 percent is administered by the Forest Service, and 5 percent is privately owned. Past and present actions that have influenced land use and access in the 3 Bars ecosystem are discussed in Section 3.3.2.3.3.

3.25.3.4.1 Cumulative Effects under Alternative A (Preferred Alternative)

Agriculture, land development, and mineral, oil, gas, and hydrothermal exploration and development could affect lands within the CESA in the reasonably foreseeable future, including land sales, new croplands, roads, and rights-of-way for power and telephone lines. These actions would provide economic benefits to the local community, but would also result in loss of fish and wildlife habitat, and possibly recreational opportunities.

The Mount Hope Project would directly disturb approximately 8,300 acres over the long-term and another 6,000 acres would be fenced to exclude the public and livestock. The proposed mine project would have economic costs and benefits. Economic costs would include the loss of 32 AUMs in perpetuity due to construction of the mine pit. In addition, another 781 AUMs would be lost for approximately 70 years due to the mine project. The total economic cost from these reductions is estimated at $56,560 annually during the 70 year period ($69.57 multiplied by 813 AUMs), and $2,226 in perpetuity thereafter, all other things remaining the same. More than 70,000 AUMs of livestock grazing are supported annually on public lands in the 3 Bars Project area and nearby areas of the CESA around the Mount Hope Project area. Consequently, the loss of grazing associated with the mine project would represent about 1 percent of the AUMS in the surrounding area and less than 1 percent of total grazing levels within Eureka County. In addition, there could be some impact to property values from the loss of AUMs, but this loss is difficult to quantify. While this impact may not be significant to the ranching community, the impact may be important to individual ranch operations. This loss of income was considered potentially significant in the Mount Hope Project EIS (USDOI BLM 2012b:3-421 to 3-422). In addition, there would be losses of AUMs associated with the 3 Bars Project, although annual losses would vary depending upon the amount of acreage treated, and where. These losses would occur at the same time as those for the Mount Hope Project, and would be a cumulative effect.

Construction employment for the Mount Hope Project would peak at about 600 workers, with about 455 workers needed for mine operations. There would be a similar level of indirect employment as a result of the mine project. Thus, the number of workers within Eureka County could increase by 50 percent from current levels due to the mine project. Annual mine payroll is projected to be $33.4 million at full production, about half of which is projected to

accrue to Eureka County residents. The increase in income would be equal to about 28 percent of the income realized by local residents in 2008. Mining taxes over the life of the project are estimated at $384 million, while sales and use tax revenues would total about $63.9 million during construction through year 10 of operation. Additional information on mine-related revenues and costs, and their effects on housing, social conditions, and the affected public, is available in the Mount Hope Project EIS (USDOI BLM 2012b:Section 3.17).

3 Bars Project treatments would have little impact on population growth, as most work would be done by local or outside contractors for short periods each year. The Mount Hope Project, however, would significantly impact the local population. The population of southern Eureka County is expected to increase by about 50 percent during the construction phase, and decrease slightly from this during mine operations (USDOI BLM 2012b:3-540 to 3-541).

Public and private lands in the CESA are used for a variety of recreational uses. It is expected that recreation activity would reflect population growth in Eureka County over the life of the project.

Since 1985, wildfires have burned about 7,000 acres annually in the 3 Bars Project Area CESA, at an estimated annual cost of $1,890,000, including costs for fire suppression and burned area rehabilitation (USDOI BLM 2007c:4-131). Wildfires degrade fish and wildlife habitat, and may destroy human property, at substantial cost to recreation users and landowners. In addition, it is difficult to restore some burned lands, due to their remote location and uneven terrain, and noxious weeds and other invasive non-native vegetation often out-compete and displace native vegetation, to the long-term detriment of resources used by the public. Based on past acreage burned by wildfires, approximately 140,000 acres would burn over the next 20 years in the CESA, at an estimated cost of $37.8 million for fire suppression and burned area rehabilitation costs.

To reduce the risk of wildfire and improve 3 Bars ecosystem health, the BLM proposes to treat 127,000 acres under the 3 Bar Project, and about an additional 15,000 acres under current and reasonably foreseeable future authorizations within the CESA, including in high to very high wildfire risk areas within the CESA. These include treatments of noxious weeds and other invasive non-native vegetation on up to about 1,000 acres annually within the CESA. New infestations would typically be found in newly burned or disturbed areas, and in areas where livestock and wild horses congregate. Herbicide treatments generally cost about $50 per acre or less, so the economic benefits would be negligible. Treatments that remove hazardous fuels, including decadent and diseased pinyon-juniper and cheatgrass and other non-native vegetation, and construction of fire breaks, would be expected to reduce the risk of catastrophic wildfire and its associated costs on about 8 percent of the CESA.

3 Bars Project and other BLM actions within the CESA would have little effect on the social and economic conditions within the CESA. The growth in economic activity and social trends, and stakeholder perceptions and concerns regarding various issues related to rangeland health, including grazing use, the allocation of forage for wildlife, wild horses, and grazing, would generally be greatest under Alternative A.

3.25.3.4.2 Cumulative Effects under Alternative B (No Fire Use Alternative)

The effects from non-3 Bars Project reasonably foreseeable future actions on social and economic values would be similar to those described under Alternative A The social and economic benefits from actions under Alternative B would be limited in scale compared to those from the Mount Hope Project and other proposed infrastructure development projects and agricultural in the reasonably foreseeable future.

The BLM would conduct treatments on approximately 63,000 acres on the 3 Bars Project area, and about another 15,000 acres on other portions of the CESA, or collectively about 4 percent of the CESA, to reduce hazardous fuels

and improve fish and wildlife habitat. The types of risks and benefits to social and economic resources under Alternative B would be similar to those for Alternative A within the CESA. The economic costs and benefits to social and economic resources under Alternative B would be about one-half those for Alternative A within the CESA. 3 Bars Project and other BLM actions within the CESA would have negligible effect on the social and economic conditions within the CESA. The growth in economic activity and social trends, and stakeholder perceptions and concerns regarding various issues related to rangeland health, including grazing use, the allocation of forage for wildlife, wild horses, and grazing, would generally be less under Alternative B than under Alternative A.

3.25.3.4.3 Cumulative Effects under Alternative C (Minimal Land Disturbance Alternative)

The effects from non-3 Bars Project reasonably foreseeable future actions on social and economic values would be similar to those described under Alternative A. The types of risks and benefits to social and economic resources under Alternative C also would be similar to those for Alternative A within the CESA.

The BLM would conduct treatments on approximately 32,000 acres on the 3 Bars Project area, and about another 15,000 acres on other portions of the CESA, or collectively about 2 percent of the CESA, to reduce hazardous fuels and improve fish and wildlife habitat. The economic costs and benefits to social and economic resources under Alternative C would be about one-fourth those for Alternative A within the CESA. 3 Bars Project and other BLM actions within the CESA would have negligible effect on the social and economic conditions within the CESA. The growth in economic activity and social trends, and stakeholder perceptions and concerns regarding various issues related to rangeland health, including grazing use, the allocation of forage for wildlife, wild horses, and grazing, would generally be less under Alternative C than under Alternatives A and B.

3.25.3.4.4 Cumulative Effects under Alternative D (No Action Alternative)

Under Alternative D, effects from non-3 Bars Project reasonably foreseeable future actions on social and economic values would be similar to those described under Alternative A. There would be no cumulative effects on social and economic values and environmental justice from 3 Bars Project treatments as no treatments would be authorized under this alternative. The BLM could create fire and fuel breaks; thin and remove pinyon-juniper to promote healthy, diverse stands; slow the spread of noxious weeds and other invasive non-native vegetation using ground-based and aerial application methods of herbicides, especially cheatgrass; restore fire as an integral part of the ecosystem; and reduce the risk of a large-scale wildfire under current and reasonably foreseeable future authorized actions, but on a very limited acreage (about 1,500 acres annually). Thus, benefits to social and economic values and environmental justice would be negligible and least among the alternatives.

3.25.3.5 Unavoidable Adverse Effects

Implementation of the 3 Bars Project would result in short-term adverse effects on livestock grazing, outdoor recreation, and wildfire risk, which would have economic and social manifestations affecting individual ranchers and the local economy. The economic effects would include reductions in ranch income, higher management costs for ranchers, and adverse effects on local businesses and tax revenues. Adverse social effects could include changes in recreation experience (quality of life) and stress for individuals and households engaged in the ranching industry. Closures of treatment areas for extended periods of time could temporarily affect some recreational uses and commercial activities.

3.25.3.6 Relationship between Local Short-term Uses and Long-term Productivity

Restoration treatments would adversely affect use of treated areas over the short-term. Any restrictions on the use of treated lands could cause social and economic hardship to affected parties. However, individuals and industries involved in the restoration of native ecosystems on public lands would benefit.

Over the long-term, most users of public lands, and those with interests near public lands, would likely benefit. An important goal of treatments is to restore ecosystem health so that public lands can provide sustainable and predictable products and services. In addition, treatments would reduce risks associated with large-scale wildfire, improve ecosystem health to the benefit of recreational and other public land users, and emphasize employment- and income-producing management activities near those communities most in need of economic support and stimulus. The enhancement in long-term productivity of public lands and in the ability of the land to provide for social and economic needs would reflect not only the success or failure of treatments, but also the influence of outside forces (e.g., economy, lifestyle changes, climate) over which the BLM and other federal agencies have no control (USDOI BLM 2007b:4-250).

3.25.3.7 Irreversible and Irretrievable Commitment of Resources

Implementation of the 3 Bars Landscape Project would require the commitment of natural, human, engineered, and monetary resources, as well as the resource commitment associated with subsequent changes to existing natural resources (e.g., existing pinyon-juniper stands). Once completed, most of the resource investments would be irretrievable and their use for this project would preclude or foreclose their use for other purposes. The latter characteristic serves to make these resource commitments largely irreversible from a social and economic perspective. However, because of the environmental restoration objectives associated with the landscape restoration initiative, the long-term environmental and potential social and economic effects of the resource commitments are viewed as positive.

3.25.3.8 Significance of the Effects under the Alternatives

Based on the criteria used to determine if social and economic values and environmental justice effects are significant, none of the alternatives would have significant direct, indirect, or cumulative effects.

3.25.4 Mitigation

No mitigation measures are proposed for social and economic values and environmental justice effects.

3.26 Human Health and Safety

3.26.1 Regulatory Framework

3.26.1.1 Federal Laws

The BLM must comply with laws and regulations that are protective of human health and safety. Numerous federal statutes, including the Clean Air Act, the Clean Water Act, the Safe Drinking Water Act, and the Resource Conservation and Recovery Act have been established to regulate actions that may directly pose human health risks through degradation of air and water quality and land pollution.

Under the Clean Air Act, the USEPA sets limits on air pollution and certain air pollutants, including sulfur dioxide, nitrogen dioxide, carbon monoxide, ozone, lead, and particulate matter. An interim policy to address public health and welfare impacts caused by wildland and prescribed fires that are managed to achieve was adopted by the USEPA in May 1998. Visibility impairment and ambient air quality worse than the national ambient air quality standards for particulate matter are used as the principal indicators of public welfare impacts. The USEPA policy is interim until further recommendations from the U.S. Department of Agriculture's Air Quality Task Force and final rules for implementing USEPA's Regional Haze Program are adopted.

The Clean Water Act regulates discharges of pollutants and sets water quality standards for all contaminants in surface waters of the U.S. The Safe Drinking Water Act was established to protect the quality of drinking water in the U.S., including all surface or underground waters sources that may potentially be designated for drinking use.

The generation, transportation, treatment, storage, and disposal of hazardous waste is regulated by the Resource Conservation and Recovery Act, as administered by the USEPA. In the case of spills of hazardous materials, requirements for agency notification and clean-up procedures are regulated under the Comprehensive Environmental Response, Compensation, and Liability Act also administered by the USEPA.

Under the Occupational Safety and Health Act (OSHA) of 1970, employers are responsible for providing a safe and healthful workplace. In addition to complying with all applicable OSHA standards, employers must also comply with the General Duty Clause of the OSHA, which requires employers to keep their workplace free of serious recognized hazards.

3.26.1.2 Nevada Laws

Nevada State regulations related to water and to air are outlined in Nevada Administrative Code and Nevada Revised Statutes 100-955 and 445B 100-445 B.845, respectively.

The State of Nevada's Division of Environmental Protection is authorized to implement air pollution control requirements in Eureka County. The State of Nevada's standards for ambient air quality differ from the USEPA's established National Ambient Air Quality Standards for criteria pollutions including the notable addition of standards for carbon monoxide at elevations at or greater than 5,000 feet amsl. In order to meet the USEPA's interim air quality policy on wildland and prescribed burns, the Bureau of Air Quality Planning's Mobile, Smoke and Area Sources Branch coordinates and facilitates the management of prescribed outdoor burning in Nevada.

Nevada's laws regarding occupational diseases and occupational safety and health are set forth in Nevada Administrative Code and Nevada Revised Statutes § 617 and 618 respectively.

3.26.2 Affected Environment

3.26.2.1 Study Methods and Study Area

Background information pertinent to human health issues for the 3 Bars Project area has been compiled from various public agencies and other data sources, including the State of Nevada Health Division, U.S. Census Bureau, U.S. Department of Labor, American Cancer Society, and the National Centers for Disease Control and Prevention, Injury Prevention and Control, and Health Statistics. Data on motor vehicle injuries and death was obtained from the U.S. Department of Transportation National Highway Traffic Safety Administration.

Information about occupational health issues and risk was obtained from the State of Nevada and National Institute for Occupational Safety and Health Administration and the Bureau of Labor Statistics. Information pertinent to wildfires and associated health issues was obtained from the USEPA, the National Interagency Fire Center, the Western Greater Basin Coordination Center, the National Wildfire Coordinating Group, the U.S. Fire Administration, the Nevada BLM, and the State of Nevada Division of Environmental Protection Bureau of Air Quality Planning.

The study area for direct, indirect, and cumulative human health and safety effects is the southern portion of Eureka County, from the BLM Elko District boundary to the Nye County line (**Figure 3-1**).

3.26.2.2 Health Risks

The leading causes of deaths in Nevada and Eureka County are presented in **Table 3-74**. The most common causes of death in Nevada include heart disease, cancer, chronic lower respiratory disease, accidents, cerebrovascular diseases (strokes), and suicide. The four leading causes of death in Eureka County are heart disease, cancer, accidents, and respiratory disease. Strokes and intentional harm (suicide) are equally ranked as the fifth leading cause of death.

Eureka County has higher than average mortality rates for heart disease and accidents and slightly higher than average incidences of suicide, compared to averages compiled for the entire state of Nevada. Eureka County has low to average mortality rates for cancer, respiratory, and cerebrovascular (stroke) diseases.

TABLE 3-74

Leading Causes of Death in Nevada and Eureka County, 2000 to 2008

Cause of Death	Percent of Total Deaths	
	Eureka County	Nevada
Heart Disease	40	25.7
Cancer	19	22.6
Chronic Lower Respiratory Disease	5	6.4
Accidents/Injuries	9	5.3
Cerebrovascular Disease (Stroke)	3	5.2
Intentional Harm (Suicide)	3	2.5
All other causes of death	21	32.3

Source: Nevada State Health Division (2011a).

3.26.2.2.1 Risks from Diseases

As the nation's leading cause of death, heart disease results in approximately one in every four deaths (26 percent) in the U.S. Lifestyle and certain medical conditions, such as high cholesterol and blood pressure levels, diabetes, smoking, obesity, physical inactivity, poor nutrition, and alcohol use contribute to increased risk of heart disease. Heart disease is also the leading cause of death for both men and women in Eureka County. Forty percent of the total deaths in Eureka County between 2000 and 2007 were attributed to coronary heart disease, which is 1.5 times higher than the mortality rate for heart disease in Nevada and the U.S.

Cancer is the second leading cause of death in the United States, Nevada, and Eureka County. According to the American Cancer Society, the probability of developing cancer during a person's life is 1 in 2 for men and 1 in 3 for women. There are many causes of cancer development, including lifestyle conditions (smoking, obesity, and poor

nutrition), as well as occupational exposure to carcinogens, environmental contaminants, and substances in food. In the U.S., one-third of all cancers are attributed to tobacco smoking. Occupational exposures were previously estimated to account for approximately 4 percent of cancer deaths in the U.S. Further studies indicate that the burden of occupational cancer is actually higher, and some workers have a proportional increase in mortality before age 65, compared to those without occupational exposures.

3.26.2.2.2 Risks from Injuries

In Nevada, injury is a leading cause of death for children, teens, and young adults. For older adults, aged 45 years and greater, other medical conditions, such as heart disease and cancer, result in more deaths than injury (Nevada State Health Division 2011b).

Motor vehicle crashes are the leading cause of injury in Nevada, and account for more than 46 percent of all unintentional injury deaths in the state (Nevada Health Division 2005). More than 53 percent of reported trauma injuries in Nevada were attributed to motor vehicle, motorcycle, and pedal cycle crashes (Nevada State Health Division 2005).

Unintentional falls are the second leading cause of injury in Nevada, and rank among the most serious injuries facing the elderly. Falls represented 12 percent of all reported trauma injuries in the Nevada from 2000 to 2002. Falls are the second leading cause of occupational injury-related fatalities, after transportation-related deaths (Chino et. al 2010).

Other causes of injury include stabbings, assaults, and fights, pedestrian injuries (11 percent of reported injuries), gunshot wounds (7 percent), and all other injuries (7 percent; Nevada State Health Division 2005). Gunshot wounds account for the second highest number of unintentional injury deaths in the State.

3.26.2.2.3 Motor Vehicle Mortality

Motor vehicle crashes are the leading cause of death and injury for Nevadans aged 5 to 34 years. In 2006, 62,225 motor vehicle crashes resulted in 32,669 injuries and 423 deaths. Most motor vehicle accidents occur during daylight hours in clear weather conditions. More males than females are injured in motor vehicle crashes, and in 2006, alcohol was involved in 10 percent of non-fatal and 30 percent of fatal motor vehicle crashes in 2006 (Chino et. al 2010).

Rural communities are at a much higher risk for motor vehicle injury and death. Higher vehicle speeds, fewer traffic control devices, and/or longer distances to emergency medical care facilities may factor into the higher motor vehicle fatalities rates in rural areas. In Nevada, Eureka County has the second highest rate of motor vehicle fatalities, at 47.2 per 100,000 people (age adjusted for the combined years 2000 through 2008; U.S. Department of Transportation 2010a). This rate is more than triple the median rate of 17.1 for all U.S. counties, as estimated by the U.S. Department of Transportation National Highway Traffic Safety Administration.

3.26.2.2.4 Occupational Fatalities and Injury

An occupational fatality or injury is death or bodily damage, respectively, resulting from working. The fatality or injury may result from a single event (e.g., a fall from a building), or it may represent a physical injury which results from repeated use or exposure.

In 2010, the highest number of fatal work injuries in the U.S. occurred in the transportation and material moving occupations (U.S. Department of Labor Bureau of Labor Statistics 2011a, b). However the highest reported fatal work

injury rate (25.3 per 100,000 full-time equivalent workers) was for the farming, fishing, and forestry occupation groups. The transportation and construction industries had the second and third highest fatal work injury rates (14.2 and 11.5, respectively).

During the period 2003 to 2008, there were 324 occupational injury-related deaths, primarily involving males, in Nevada (Chino et al. 2010). During this period, Nevada's occupational injury fatality rate was 1.8 per 100,000 people, slightly higher that U.S. rate of 1.4 per 100,000 people. In 2010, Nevada's non-fatal occupational injury and illness total recordable case incidence rate was 3.8 per 100 full-time workers in private industries and state and local governments, which was slightly higher than the national rate of 3.5 (U.S. Department of Labor Bureau of Labor Statistics 2011a, b).

Forty-two percent of all occupational injury-related fatalities in Nevada result from transportation incidents. Construction and mining injuries involving falls represent 20 percent of all occupational fatalities. Contact with equipment is also common, while occupational injury fatalities resulting from violence and exposure to harmful substances or environments occur less frequently (Chino et. al 2010). Over 90 percent of non-fatal occupational cases are attributed to injuries. Five percent are attributed to illnesses associated with repetitive motion cases, systemic diseases and disorders, skin diseases, hearing loss, respiratory conditions, and poisoning (U.S. Department of Labor Bureau of Labor Statistics 2011 a, b).

In 2010, the non-fatal occupational injury rate of 4.5 reported for the agricultural, forestry, fishing, and hunting industry was higher than the national rate of 3.5 per 100 workers. However the rate of non-fatal incidents resulting from crop and animal production and other support activities for agricultural and forestry was greater than the rate of those directly associated with natural resources and mining, forestry and logging.

Within the BLM, the national injury rate (total accidents and illnesses) for 2009 to 2011 was 8.4 per 100 workers, which is the same as the injury rate for the Nevada BLM during the same period. Within the Battle Mountain District, the injury rate was lower, at 5.3. Lost time injury rates in the Battle Mountain District for 2009 to 2011 averaged 1.64, compared to 2.4 for the Nevada BLM and 2.1 for the BLM nationally (USDOI BLM 2012q).

From 2009 to 2011, the most common types of injuries in the BLM Battle Mountain District were falls, followed by slips/twists/trips and weather exposure. For the BLM statewide, the most common injuries were unclassified, slips/twists/trips, manual labor, and equipment (USDOI BLM 2012q). Hazards associated with poisonous plants and insects, dangerous wildlife, falling objects, including trees, protruding branches and twigs, and other obstacles on the ground that may cause slips and falls may be encountered by workers during BLM activities. Extreme and adverse weather conditions may lead to workers suffering heat-related illness or hypothermia.

The operation of tools and equipment, such as chainsaws and mowers, may present inherent risks, such as exposure to hazardous fuels and lubricants used in the mechanized equipment, sharp tool edges, and loud noise that could result in hearing damage to workers. Nearby workers and the public can be struck by flying debris around some equipment. Equipment operators could also be injured from improperly operating or losing control of the machinery on steep or slippery terrain. Some injuries and fatalities have occurred during use of all-terrain vehicles.

Injuries can vary from minor cuts, sprains, bruises, and abrasions to major arterial bleeding, compound bone fractures, serious brain concussions, and death. Manual and mechanical methods treatment methods also present potential ergonomic hazards related to lifting and carrying equipment, and when pulling vegetation. Improper body mechanics may lead to muscular-skeletal injuries. Some chronic disorders associated with repeated trauma are directly linked to

the nature of the work. For example, a large proportion of workers regularly using hand-held power tools, such as chippers, grinders, chainsaws and jackhammers, often suffer from the effects of vibration syndrome, which causes blanching and reduced sensitivity in the fingers.

3.26.2.2.5 Risks from Fire

Wildfires cause the loss of life and property. According to compiled data reported by the National Interagency Coordination Center, over 74,000 wildfires burned more than 8,700,000 acres in the U.S. in 2011 (National Interagency Coordination Center 2011). More than 86 percent of all reported fires in the nation were caused by humans.

According to the U.S. Fire Administration, 81 U.S. firefighters died while on duty in 2010. Ten on-duty firefighters died in association with wildfires, the lowest number of annual firefighters associated with wildfires since 1996. Heart attacks were responsible for the deaths of 48 firefighters (59 percent) in 2011. Fifty-four percent of all firefighter fatalities occurred while performing emergency duties. Only three firefighters were killed in vehicle collisions.

For the past decade, the leading cause of all USDOI/USDA wildland firefighter fatalities has been aviation accidents (50 percent; National Wildfire Coordinating Group 2010). Additional leading causes of wildland firefighter fatalities include burnovers/entrapments (20 percent), driving accidents (13 percent), heart attacks (7 percent), and hazard trees (6 percent).

Smoke from wildfires is a mixture of gases that may cause irritation to the throat and eyes. Although the main components of smoke are water vapor and carbon dioxide, other pollutants and fine particulate matter are also present. Fine particulate matter is the primary human health concern for smoke management. Because of its small size (similar to a pollen grain), smoke can easily penetrate deep into lung tissues causing severe respiratory and cardiovascular disease.

The average exposure to smoke and its most likely hazards, acrolein, benzene, carbon monoxide, formaldehyde and $PM_{2.5}$, among 200 firefighters at prescribed burns in the Pacific Northwest, was studied by the USDA Forest Service, Pacific Northwest Research Station and Radian Corporation between 1991 and 19, and acrolien) and 2 percent of the carbon monoxide exposures exceeded permissible exposures limits set by the OSHA. Average exposures were highest during line holding, line supervision, and direct attack activities during the fire (Reinhardt et al. 2000). In most cases, the unexposed time spent traveling and setting up the prescribed burn reduced the overall work shift exposure to levels below the permissible exposure limits. Benzene exposure was found to not be significant.

Persons with heart or lung disease may be more suspect to irritation from exposure to smoke. Particulate matter in smoke can also significantly reduce visibility on highways by scattering and absorbing light, thus compromising safe driving conditions.

3.26.3 Environmental Consequences

3.26.3.1 Key Issues of Concern Considered during Evaluation of the Environmental Consequences

No issues of concern pertaining to human health and safety were identified during scoping, except for treatments using herbicides. The BLM does not propose to use herbicides under the alternatives.

3.26.3.2 Significance Criteria

The following would have a significant adverse effect on human health and safety:

- Loss of life, or moderate to severe injuries which may require hospitalization.
- Exposure of workers or the public to chemicals, contaminants, or smoke at levels that would cause adverse health effects.
- Violation of any laws or regulations implemented to protect worker or public health and safety.

3.26.3.3 Direct and Indirect Effects

3.26.3.3.1 Direct and Indirect Effects Common to All Action Alternatives

This analysis assumes that the SOPs, which have been designed expressly to protect worker and public health and safety, would be effective at preventing most accidents and injuries (see **Appendix C**). However, it is also assumed that some injuries could still occur, particularly if workers do not follow the SOPs closely.

Under all alternatives, and for all treatment methods, workers conducting the treatments could be at risk for adverse effects from walking on uneven ground, on broken terrain, and in dense vegetation. Other potential adverse effects associated with the proposed treatments would vary by treatment method, as there are human health risks unique to each method.

Treatments that remove noxious and poisonous weeds and other harmful vegetation near public use sites and facilities would benefit public health and welfare and would involve all treatment methods. Treatments that reduce the risk of catastrophic wildfire on public lands would have similar benefits to human health and safety. These benefits are discussed in the 17-States PER (USDOI BLM 2007c:4-139). Benefits would include reduced threats to public health and safety, as well as to air quality, firefighters, and property.

3.26.3.3.2 Direct and Indirect Effects under Alternative A (Preferred Alternative)

Riparian Treatments

Adverse Effects

Manual treatments utilized in riparian zones (installation of small, temporary exclosure fencing and plantings) should not adversely affect public health or physical well-being, as appropriate safety zones around work areas would prevent public access. The greatest risks to human health and safety from manual treatments would be to workers performing the treatments. These risks are discussed in the 17-States PER (USDOI BLM 2007c:4-137). Risks include exposure to plant irritants, biting and sucking insects, poisonous snakes, physical exertion, falls, use of hand tools, and noise and exhaust from motorized equipment. The SOPs designed to protect worker health and safety would minimize risks for severe injuries, as well as most minor injuries. Appropriate first aid treatment on site would also help to minimize the risk of infection or other long-term effects from minor injuries. Provided SOPs are followed, no laws or regulations implemented to protect worker or public health or safety would be violated, and the risk of injuries resulting in loss of life or hospitalization would be minimized. Nonetheless, it is possible that moderate to severe injuries could result from use of hand tools such as chainsaws.

Similar to manual treatments, the greatest health and safety risks associated with mechanical treatments would be to workers performing the treatments, rather than to the public. The public would be at a slight risk of injury from flying debris, but these risks would be minimized by maintaining safety buffers around mechanical treatment areas. Risks to workers from mechanical treatments are discussed in the 17-States PER (USDOI BLM 2007c:4-137). These risks include injuries associated with use of heavy equipment, contact with sharp cutting blades, exposure to rocks and other flying debris, loss of control of equipment, high noise levels, and vehicle exhaust. Risks would be greatest for project groups with the most extensive mechanical treatment component, involving streambank earthworks and pinyon-juniper removal (Garden Spring Group and Frazier Creek Group). For the Denay Pond group, risks would be lower, since only fence installation would occur. For all mechanical treatments, risks would be minimized through the use of appropriate SOPs.

Beneficial Effects

Treatments would help reduce the risks to human health from wildfire smoke and fire. Additionally, treatments that improve the physical and ecological processes of creeks and that improve water quality in water bodies designated for beneficial uses (such as fisheries, irrigation, and drinking water) would be likely to benefit human health by providing cleaner water for drinking and for aquatic species that are consumed by the public.

Aspen Treatments

Aspen treatments would consist of manual and mechanical methods and may include small, temporary exclosures/changes in livestock use. Risks associated with creating exclosures or changing livestock use would be minimal, provided SOPs were followed. The initial acreage of aspen identified for treatment is low (451 acres over the life of the project). Therefore, associated health and safety risks initially would be localized to very small areas in the Roberts Mountain, JD, 3 Bars, and Santa Fe allotments.

Pinyon-juniper Treatments

Adverse Effects

The number of people potentially exposed to treatment projects could be relatively high for pinyon-juniper enhancement projects, given the size of treatments and the geographic area covered. Risks to workers and the public from treatments in these areas would be similar to those described for aspen enhancement projects.

The potential effects associated with use of prescribed fire are discussed in the 17-States PER USDOI BLM (2007c:4-135). Workers and the public would be at risk for fatality or injury as a result of the fire itself, from inhalation exposure from combustion products. Standard Operating Procedures would be implemented to protect workers and the public from fire-related injuries. Smoke inhalation could result in health risks, particularly for those exposed to smoke repeatedly over a long period, such as firefighters. Of greatest toxicological concern are polynuclear aromatic hydrocarbons, which contain multiple carcinogenic materials. A human health risk assessment was completed in 2007 (and also used for the 17-States PEIS and PER) estimated that cancer risks to workers and the public from polynuclear aromatic hydrocarbons found in wood smoke are very low (USDOI BLM 2007b:4-136).

Recreational users near treatment sites could be exposed to smoke from prescribed fire. Advance notice to the public and posting treatment areas would warn recreational users about potential smoke related impacts so that they could avoid use of nearby recreation sites.

Fires can affect public safety by reducing visibility and create hazardous driving conditions on nearby roads. The Sulphur Spring Wildfire Management Unit (62,000 acres) and the Whistler Unit (23,000 acres), in particular, are adjacent to State Route 278 and U.S. Highway 50, where the risks to motorists from reduced visibility would likely be greatest. Prescribed fires in the Whistler Unit would generally be 5 to 50 acres in size. Wildland fires managed for resource benefit in the Sulphur Spring Wildfire Management Unit would be 1,000 acres or less. When there are potential visibility issues on public roadways, the BLM utilizes traffic control measures and road signing, as appropriate, to reduce safety risks to motorists (USDOI BLM 2002).

To limit air quality impacts and the associated potential human health effects from smoke inhalation, the BLM would implement site-specific fire prescriptions to minimize impacts to air quality. These prescriptions could include timing the fire to minimize smoke, procedures to limit the smoldering stage, and procedures to reduce fire intensity (USDOI BLM 2002). Most risks associated with prescribed fire would be offset by reductions in the incidence of wildfires, which would be expected to release more smoke and affect people over a larger geographic area than prescribed fires.

Wildland fire for resource benefit would be used in addition to prescribed fire, which does not allow the same degree of pre-planning to reduce smoke impacts as prescribed fire. The BLM would measure air parameters and take appropriate action to reduce these emissions if these parameters are exceeded. Fires near roadways could affect human health and safety by reducing driving visibility and increasing the risk of an accident.

Beneficial Effects

Much of the focus of pinyon-juniper management is to reduce the risk of catastrophic wildfire. Creating and enhancing fuel breaks in pinyon-juniper stands associated with the Atlas Unit group would break up of the continuity of fuels, moderate fire behavior, and reduce the risk of loss of life and property from a catastrophic wildfire. On the Cottonwood/Meadow Canyon, Dry Canyon, Lower Pete Hanson, Three Bars Ranch, Tonkin North, and Whistler units, the focus of treatments would be on hazardous fuels reduction using manual and mechanical methods and prescribed fire. Much of the west slope of Roberts Mountains has not experienced a large-scale wildfire in over 100 years. These units have been identified as having high to very high risk of catastrophic wildfire, or in the case of the Tonkin North, Lower Pete Hanson, and Whistler units, very high to extreme wildfire risk (**Figure 3-36**). The Three Bars Ranch is at the base of Roberts Mountains.

Pathogens and pests, including mistletoe, have led to unhealthy pinyon-juniper stands in the Tonkin North and South units and a build-up of hazardous fuels. The BLM proposes to remove up to half of the trees using manual and mechanical means and prescribed fire. These projects would enhance the health and resilience of pinyon-juniper woodlands and reduce the amount of hazardous fuels and wildfire risk.

The BLM would restore fire as an integral part of the ecosystem, improve species diversity, and reduce hazardous fuels on the Sulphur Spring Wildfire Management Unit by using wildland fire for resource benefit. The BLM would allow fire to burn on about 20 to 40 percent of the area. Several wildfires have occurred in this area in recent years due to dense fuel accumulations and pinyon-juniper cover. As discussed above, the Sulphur Spring Wildfire Management Unit is near State Route 278.

Over the long-term, hazardous fuels reduction and other actions to reduce wildfire occurrence would lead to substantial benefits as far as reducing human exposure to smoke. Unplanned or unwanted fires, such as catastrophic wildfires, can pose serious threats to public health and safety, as well as to air quality. Because these fires are uncontrolled, they can pose significant threats to the safety of firefighters and the general public and destroy property.

The intense or extended periods of smoke associated with uncontrolled wildfires can cause serious health problems and decrease visibility. Wildfires also cause the loss of life and property.

Prescribed fires and fire use for resource benefit, on the other hand, are used to restore natural fire cycles, reduce the buildup of hazardous fuels, and restore native vegetation and natural ecosystem processes. Scheduling burning during favorable weather conditions and controlling the amount of fuel and acreage burned can minimize emissions and adverse effects of smoke on public health and the environment. As part of this effort to manage smoke and its health effects, the BLM would use alternative treatments to fire, including mechanical and manual treatments, and reduce fuel levels before burning. Mechanical thinning and biomass utilization are part of the suite of treatments the BLM would use in areas where fire presents an unacceptable risk (USDOI BLM 2007c:4-13).

Sagebrush Treatments

Adverse Effects

Human health and safety risks associated with biological control would be minimal, and are discussed in the 17-States PER (USDOI BLM 2007c 4-138). They primarily include physical injuries to workers from livestock, and injuries associated with use of equipment to release biological control agents at treatment sites. Risks for these injuries would be reduced by following standard SOPs, such as wearing appropriate personal protective equipment and using equipment that is maintained properly.

Prescribed fire would be used to control cheatgrass on the West Simpson Park Unit. The more predominant health and safety risk factors in sagebrush treatment unit would be to workers using mechanical equipment.

Beneficial Effects

Much of the focus of sagebrush treatments is to reduce the risk of catastrophic wildfire. Treatments to reseed and replant to promote sagebrush and perennial grass cover, and reduce the occurrence of cheatgrass and other noxious weeds and other invasive non-native vegetation on the Rocky Hills and West Simpson Park units, should reduce this risk.

3.26.3.3.3 Direct and Indirect Effects under Alternative B (No Fire Use Alternative)

The human health and safety risks associated with exposure to smoke from prescribed fire would not be present under this alternative. The acreage of land treated using mechanical methods, and the associated level of risk to worker safety associated with this treatment method, would be similar to that under Alternative A. Risks to workers and the public would continue to be minimized through implementation of SOPs, which would prevent worker deaths or severe injuries. It is expected that the rate of accidents associated with manual and mechanical treatments would be similar to that under Alternative A.

The effectiveness of treatments at reducing catastrophic wildfire potential would likely be less under Alternative B than under Alternative A. While mechanical treatments can be used to remove fuels, in some instances a combination of treatments (mechanical plus fire) might produce better results. Therefore, wildfire risk reduction and associated health and safety benefits would likely be less under this alternative than under Alternative A.

3.26.3.3.4 Direct and Indirect Effects under Alternative C (Minimal Land Disturbance Alternative)

Under this alternative, only manual and classical biological control methods would be used. Workers and the public would not be at risk for exposure to smoke, or for accidents associated with operation of heavy equipment. Risks associated with manual methods and classical biological control would be minimal, and SOPs for operation of hand-held equipment would help prevent accidents associated with using this equipment. Out of all the action alternatives, short-term health and safety risks associated with project treatments would be lowest under Alternative C. However the long-term health and safety benefits associated with reducing catastrophic wildfire risk would be lower than under the other alternatives because the least amount of hazardous fuel removal would occur.

3.26.3.3.5 Direct and Indirect Effects under Alternative D (No Action Alternative)

There would be no direct effects on human health and safety from 3 Bars Project treatments as no treatments would be authorized under this alternative. The BLM would not create fire and fuel breaks; thin and remove pinyon-juniper to promote healthy, diverse stands; slow the spread of noxious weeds and other invasive non-native vegetation, especially cheatgrass; restore fire as an integral part of the ecosystem; or reduce the risk of a large-scale wildfire that could be detrimental to human health and safety.

3.26.3.4 Cumulative Effects

The study area for direct, indirect, and cumulative human health and safety effects is the southern portion of Eureka County, from the BLM Elko District boundary to the Nye County line (**Figure 3-1**). This area is approximately 1,692,238 acres. Approximately 86 percent of the area is administered by the BLM, 9 percent is administered by the Forest Service, and 5 percent is privately owned. Past and present actions that have influenced land use and access in the 3 Bars ecosystem are discussed in Section 3.3.2.3.3.

3.26.3.4.1 Cumulative Effects under Alternative A (Preferred Alternative)

Members of the public who visit or drive through the 3 Bars Project area may also visit or drive through areas shown on **Figures 3-2** to **3-6**, where other projects are occurring. Additionally, workers who implement the BLM's 3 Bars treatment projects may live in the vicinity of other projects, may visit or drive through areas where other projects are occurring, or may be hired to implement other projects that have been identified. Therefore, it is likely that both workers and members of the public who would potentially be exposed to 3 Bars project treatments would also be exposed to human health and safety risks associated with other reasonably foreseeable future actions, resulting in cumulative health and safety risks.

Grazing, agriculture, woodland product harvest activities, and recreation are associated with health and safety risks, including risks of injury from livestock; installing and maintaining range improvements; applying pesticides on cropland; using saws and other hand tools to harvest woodland products; exposure to poisonous vegetation or vegetation with thorns; exposure to harmful snakes and other wildlife; or accidents from recreation activities such as off-highway vehicle use. The safety of members of the public who harvest woodland products would be dependent on each individual's personal responsibility for his or her own safety. Commercial harvest would follow the health and safety guidance of the responsible commercial entity, which should include policies and procedures for protecting human health and safety.

Projects associated with utilities construction and distribution include road development, powerlines, communication sites, wind generation facilities, railroads, and related projects. All of these projects have associated occupational and

public health and safety risks during the construction phase, and some would have associated risks during the operational phase. It is assumed that industry standard SOPs and other procedures would be implemented to minimize health and safety risks. Road development is expected to be limited to dirt roads created by recreational use of public lands. However, traffic volumes on U.S. Highway 50 and State Route 58, as well as other roads are predicted to increase as a result of increased economic activity and population growth. New roads and increased traffic would increase the risk of injuries from motor vehicle crashes, which is the leading cause of death and injury for Nevadans aged 5 to 34 years (Chino et al. 2010), and is already very high in Eureka County (U.S. Department of Transportation 2010a, b).

Land development, mineral development, and oil, gas and geothermal leasing and development could all have associated health and safety risks. All types of development in the CESA are expected to bring more people into the area, which would increase the number of people potentially exposed to smoke from the proposed treatments. Additionally, there are numerous health and safety risks associated with resource extraction activities. Workers and the public could be exposed to these risks, in addition to the risks associated with the 3 Bars Project. It is expected that all of the future development and resource extraction in the region would involve industry standard safety protocols designed to minimize health and safety risks to workers and the public.

Approximately 7,000 acres burn annually within the CESA, although acreage burned each year by wildfire is quite variable. Wildfires would lead to potential exposure to smoke by the public and firefighters, risk of accidents due to low visibility on roadways, and risk of loss of life and damage to property from the fire itself.

The BLM would treat about 142,000 acres (127,000 on the 3 Bars Project area, and 15,000 on other areas within the CESA), or about 8 percent of the CESA, to restore natural fire regimes and encourage the growth of native vegetation that is more resilient to wildfire, reducing the risk of wildfire. This includes the use of herbicides on several hundred acres annually under existing authorizations. Human health concerns are associated with herbicide exposure scenarios, including direct spray, dermal contact with foliage, swimming, and ingestion scenarios for public exposure, and some occupational exposures that predominantly involve contact with accidental releases of herbicides. Herbicides that could be used by the BLM generally have negligible or minor risks to workers and the public, as discussed in the 17-States PEIS (USDOI BLM 2007b:4-174 to 4-196). In all cases, human health risks can be avoided by following SOPs including to apply herbicides with appropriate protective equipment, prevent spills and other accidental releases, and prevent public access to sprayed areas for the appropriate time interval.

If plant community structure, species composition, and disturbance regimes return to near historical ranges, then disturbances should have effects that are similar to historical effects, which would be less severe, and result in less wildfire danger and risks to the public, than at present.

3.26.3.4.2 Cumulative Effects under Alternative B (No Fire Use Alternative)

The effects from non-3 Bars Project reasonably foreseeable future actions on human health and safety would be similar to those described under Alternative A. Because fire would not be used on the project area, risks associated with exposure to fire and smoke would not contribute to cumulative health effects.

Hazardous fuels reduction and habitat improvement projects could occur on about 63,000 acres within the 3 Bars Project area, and on up to 15,000 acres within the CESA, or about 4 percent of acreage within the CESA. The BLM would be limited to hand pulling, discing, plowing, and using livestock to control non-native vegetation on the 3 Bars Project area, and using chainsaws and mechanical equipment, instead of prescribed fire and wildland fire for resource

benefit, to manage pinyon-juniper. The cumulative risks to workers from these treatments could be greater from manual and mechanical methods than from fire treatments. Over the long-term, cumulative effects to health and safety associated with wildfire would be greater than under Alternative B than under Alternative A, since the acreage treated for fuels reduction would be less and treatments would likely not be as effective.

3.26.3.4.3 Cumulative Effects under Alternative C (Minimal Land Disturbance Alternative)

The effects from non-3 Bars Project reasonably foreseeable future actions on human health and safety would be similar to those described under Alternative A. Under Alternative C, the BLM would only be able to use manual and classical biological control methods to restore the 3 Bars ecosystem. Adverse, short-term effects to human health and safety with the use of fire and mechanized equipment would not occur under Alternative C. However, fire and mechanized equipment would be used in other portions of the CESA to improve habitat, remove hazardous fuels, and reduce the risk of wildfire.

By not being able to use mechanical methods and fire to reduce hazardous fuels, restore ecosystem health, create fire and fuel breaks, and remove downed wood and slash, however, the risk of wildfire and its impacts on human health and safety would likely increase on the 3 Bars Project area. About 48,000 acres would be treated in the CESA to reduce hazardous fuels, but only 32,000 acres would be treated in the 3 Bars Project area. This would be less than 2 percent of the land within the CESA and within the 3 Bars Project area.

Under Alternative C, the acreage treated would be less than under Alternatives B and C, and only manual and classical biological treatment methods would be used. Therefore, short-term cumulative health and safety risks would likely be lowest under Alternative C. Over the long-term, cumulative effects to human health and safety associated with wildfire would be greater than under the other action alternatives, as the least amount of hazardous fuel removal would occur under Alternative C.

3.26.3.4.4 Cumulative Effects under Alternative D (No Action Alternative)

Under Alternative D, effects from non-3 Bars Project reasonably foreseeable future actions on human health and safety would be similar to those described under Alternative A. There would be no cumulative effects on human health and safety from 3 Bars Project treatments as no treatments would be authorized under this alternative. The BLM could create fire and fuel breaks; thin and remove pinyon-juniper to promote healthy, diverse stands; slow the spread of noxious weeds and other invasive non-native vegetation using ground-based and aerial application methods of herbicides, especially cheatgrass; restore fire as an integral part of the ecosystem; and reduce the risk of a large-scale wildland fire under current and reasonably foreseeable future authorized actions, but on a very limited acreage (about 1,500 acres annually). Thus, benefits to human health and safety would be negligible and least among the alternatives.

3.26.3.5 Unavoidable Adverse Effects

All treatment methods have the potential to harm workers or the public. The health and safety of workers could be at risk from working on uneven ground, on broken terrain, and in dense vegetation; from the use of hand and power tools; from exposure to falling debris; from exposure to smoke from fires; and from other accidental situations. Although the BLM would implement numerous SOPs to minimize health and safety risks, not all injuries would be avoided.

Members of the public could be at risk from flying debris if they were near an area where manual or mechanical equipment was being used. Risks would be minimized by establishment of safe zones around work areas, provided the public complied with restrictions on entry into these areas. Particulate matter and other harmful materials associated with fire treatments could harm the public outside of treatment areas. However, it is expected that these exposures would be kept to minimum levels by following fire prescriptions, and conducting treatments during climatic conditions that minimize drift of smoke.

3.26.3.6 Relationship between the Local Short-term Uses and Maintenance and Enhancement of Long-term Productivity

The proposed vegetation treatments could harm the health of workers and the public over the short-term, particularly if SOPs to protect health were not followed. Adverse reactions to smoke could cause minor to severe discomfort to sensitive individuals, but most symptoms would go away in a few hours. If serious injury or death resulted from treatments, the effects on the health of the affected individual would be long-term, or in the case of death, permanent.

Proposed treatments to reduce the buildup of hazardous fuels and restore native vegetation would help restore natural fire regimes and improve ecosystem health. If treatments are successful, there would be a long-term reduction in the risk of wildfire, which would benefit public health by resulting in a reduced exposure to smoke and a reduced risk of adverse human health effects from fires.

3.26.3.7 Irreversible and Irretrievable Commitment of Resources

Serious injury or death caused by vegetation treatments could be irreversible and irretrievable. However, risk of death and serious injury is very unlikely based on the current rate of injury (very low) and death (none) associated with BLM vegetation treatments during the past decade. It is likely that a few people would experience minor discomfort from fire treatments, but these effects would be short-term and reversible.

3.26.3.8 Significance of the Effects under the Alternatives

The BLM's SOPs to protect worker and public safety substantially reduce the risks for accidents and injuries during vegetation treatments. Many employers, especially those involved with agricultural and mining operations, have health and safety plans to protect worker health. However, there is some risk for injury and adverse health impacts associated with all working conditions, such as those associated with operation of chainsaws and heavy equipment, working on uneven terrain, and managing fires. Accidents would be possible. If workers do not follow SOPs closely, severe injuries could occur. While SOPs provide the maximum amount of realistic prevention of injury, it is not possible to state that death or moderate to severe injury would not occur. Exposure of workers to chemicals, contaminants, and smoke is possible, but the health effects of these exposures should be limited to insignificant levels through SOPs to limit exposure, use of Personal Protective Equipment, and establishing safety buffers around treatment sites. Standard Operating Procedures also would ensure that the BLM's treatment program did not violate any laws or regulations implemented to protect worker or public health and safety. Based on the BLM's past safety record for vegetation treatments, there has been a very low rate of injury and no deaths associated with vegetation treatment programs. Therefore, direct, indirect, and cumulative effects to human health and safety from 3 Bars Project actions are unlikely to be significant.

3.26.4 Mitigation

Given that BLM SOPs for the various treatment methods are already highly protective of public and worker health and safety, no additional mitigation is recommended.